SCHOOL OF ECONOMICS & MANAGEMENT LISBON

MASTER

FINANCE

MASTER'S FINAL WORK

PROJECT WORK

EQUITY RESEARCH VOLKSWAGEN (VW) - BUSINESS VALUATION AND ANALYSIS OF THE IMPLIED STRATEGY

JOÃO DIOGO LOURENÇO LEOTE

SEPTEMBER-2014

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Abstract

Being VW one of the biggest companies of the automotive sector it becomes interesting to study it because it is over-preforming in a sector that has been badly affected by the economic crisis.

The purpose of this project work is to present a study on VW Group in the form of an Equity Research, using methods learnt during the master and scrutinized in the chapter of Literature Review, which are the FCFF and Relative Valuation.

It was concluded that the company is undervalued. Given the shares valuation, the price of them in the stock exchange and its' potential, my recommendation is to hold.

Keywords: Automotive Industry, VW Group, FCFF, Relative Valuation and Target Price.

Resumo

Sendo a VW uma das maiores empresas do sector automóvel torna-se interessante a análise da mesma.O grupo obtém resultados consistentes e num sector que tem sido afetado pela crise econômica.

O objetivo deste projeto é apresentar um estudo sobre o Grupo VW na forma de um Equity Research, usando métodos apreendidos durante o mestrado e explanados no capítulo de Revisão da Literatura, que são o FCFF e a uma avaliação com múltiplos.

Concluiu-se que a empresa está subvalorizada. Dada a valorização de ações, o preço delas na bolsa de valores e o seu potencial, minha recomendação é para manter o investimento nas mesmas.

Palavras-chave: Indústria Automóvel, Grupo VW, FCFF, Multiplos e Preço-alvo.

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List of Abbreviations

APM - Arbitrage Pricing Model

APV - Adjusted Present Value

AR - Annual Report

BS - Balance sheet

BSB - Balance Sheet Based

Capex - Capital Expenditures

CAPM - Capital Asset Price Model

CC - Contingent Claim

CF - Cash Flow

D - Debt

D&A - Depreciations and Amortizations

DCF - Discounted Cash Flow

DDM - Dividend Discount Model

E - Equity

E (R_i) - Expected rate of return of a stock

EBIT - Earnings before Interest and Taxes

EBITDA - Earnings before Interest Taxes Depreciations and Amortizations

EnV - Enterprise Value

EPS - Earnings per share

ER - Equity Research

EV - Equity Value

EVA - Economic Value Added

FCF - Free cash flow

FCFE - Free Cash Flow to Equity

g - Growth at a constant rate

GGM - Gordon Growth Model

GM - General Motors

GRC - Governance, Risk and Compliance

IS – Income statement

k_d - Cost of debt

k_e - Cost of Equity

M&A - Mergers and Acquisitions

NCWC - Non-Cash Working Capital

NWC - Net Working Capital

OCF - Operating cash flow

OICA - *Organisation Internationale des Constructeurs d'Automobiles*

P/S - Price to Sales

PBV - Price to Book Value

PER - Price Earnings ratio

PV - Present Value

PV (TS) - PV of Tax Shields

R_f - Risk-free rate

R_m – Market return

R_m - R_f - Market risk premium

RMS/ICS - Risk Management and Internal Control systems

ROA - Return on Sales

ROE - Return on Equity

SWOT - Strengths Weaknesses Opportunities Threats

T - Taxes

TV - Terminal value

VW - Volkswagen

WACC - Weighted average capital cost

β – Risk

β_l - Levered β

β_u - Unlevered β

Introduction

With the degradation of the automobile sector, demand reduction, too much supply and with bad results from the majority of automotive companies it becomes interesting to see what one of the big companies did to get around this panorama. The VW Group was able to turn around the negative trend and environment that affect this industry and have been presenting very positive results.

In this MFW I intended to present VW group defining their structure, risks that faces and future strategy. Likewise it will be provided a stock market performance analysis, in addition to a macroanalysis and an operational and financial framework will be developed concerning the company. Regarding the external environment it will be developed a brief industry and competitor's analysis.

By observing the firm in its essence, a strategical analysis was done concerning SWOT and Porter analysis. What is expected by this scrutiny is to perceive a solid company.

In the end a Valuation and sensitivity analysis will be computed to reach the recommendation of what should shareholders do, buy, sell or hold. This valuation, resorting to some assumptions, will be done under two models, Discounted Cash Flow (DCF) and Relative valuations. The recommendation that is predictable due to the solid path of the company is to hold or buy more shares.

2. Literature Review

2.1. Framework

According to Carvalho das Neves (2002), for several years' managers, investors and financial researchers are trying to come up with a valid and consensual way, for all financial community, of finding a precise method for valuating a company for all parts, buyer and seller. We can't discard that the value of an asset or a firm is the equilibrium between the value that the buyer is willing to give and the value that the seller is prepared to receive for its business or company.

As stated by Damodaran (2006), firms' valuation is seen as the base for almost everything done in finance, used in Corporate Finance, Portfolio Management and Mergers and Acquisitions (M&A).

In Corporate Finance what can be observed is the impact that a different type of dividend, funding and investment choices can have in firm valuation. Furthermore it is determined that Corporate Finance aims to boost enterprise value with the effect of previous mentioned choices (Damodaran 2002, 2006).

In accordance with Damodaran (2002), valuation in Portfolio Management differs on its importance when we are comparing the two diverse categories of investors. When dealing with passive investors, valuation is not that significant, but it's a different story with active investors, where valuation is of extreme importance for Fundamental Analysts, Franchise Buyers and Efficient Marketers, because there is a need of finding the value of a company, for investment purposes, to help picking the best stock in the market.

As mentioned before, a company valuation can be seen as one of the many processes to define how much it's worth, in commercial, industrial, services or investment terms, aiming to exercise an economic activity. In most cases valuation attends to the total Equity (E), but sometimes it exists a need to only evaluate a part of the company for selling, M&A purposes. (Carvalho das Neves 2002). Relating with Fernández (2013a), in M&A, valuation is merely a manner for the seller to know the value that he should sell and the buyer to know the value he should buy, which many times aren't the same value.

Concerning Fernández & Bilan (2007), it's clear that valuation is very subjective because of the several different variables/assumptions that buyers and sellers analysts make, especially when dealing with future prospects.

2.2. Companies Valuation methods

When starting a business valuation the undoubtedly first step is to choose a process from the four main methods, which usually is chosen depending on the assumptions available or made by the analysts. According to several authors like Damodaran (2002, 2006) and Fernández (2013a), although they use different terminology, we can divide the classes of valuation between four main methods: DCF Valuation, Relative Valuation, Balance Sheet Based (BSB) Valuation and Contingent Claim (CC) Valuation.

2.2.1. DCF Valuation

We can observe on Damodaran (2002), that this valuation is the basis for all other methods of company valuation and also the most referred in the academic world (Damodaran 2006). Following Fernández (2013a), it's clear that this method uses future cash flow discounted at the proper rate that represents the risk in obtaining those flows. In its essence the firm is a CF machine, therefore its valuation will be computed by the present value (PV) of its future CF's at a discounted rate.

According to Damodaran (2002), we have to acknowledge that there are several DCF models, but however for the purpose of this MFW only the three principals will be displayed: Equity DCF Models, Firms DCF Models and Adjusted Present Value (APV) Model.

2.2.1.1. Equity DCF Models

Concerning Damodaran (2006) this model relates to company valuation with the shareholders side. Consequently, we determine the expected CF for these investors and discount them at a rate of return that is suitable for the shareholders, Cost of Equity (k_e). This process will lead us to the Equity Value (EV). (Fernández 2005).

Dividend Discount Model (DDM)

First and foremost we are before the oldest DCF Model, which is mostly neglected by several analysts. But if we take into account that investors that profit from stocks only

have two kinds of returns: dividend while holding the stock and the difference between the buying and selling price at time t, this method becomes more meaningful (Damadoran 2006).

As stated by Foerster & Sapp (2005), DDM reaches the price of an asset by discounting at the proper rate all future payments that the asset is projected to produce, i.e., discounting at k_e all expected dividends to reach the value of a stock. According to Damodaran (2006), the first expression of DDM is:

(1) $$Value\ of\ stock = \sum_{t=1}^{t=\infty} \frac{Expected\ Dividends_{\ t}}{(1+k_e)^t}.$$

In Williams (1938), we can find one of the most quoted expressions, about DDM, that characterises the reasons for using this model when searching for the EV: "A stock is worth the present value of all the dividends to be paid upon it, no more, no less" this is the first association ever made between dividends and stock value. However this model was improved several times due to its constrains. Firstly it was developed by Durand (1957) and after by Gordon (1962) reaching to the so called Gordon Growth Model (GGM). GGM stated that dividends grow at a constant rate (g) in perpetuity; EV can be computed using the following method retrieved from Damodaran (2006):

(2) $$Value\ of\ a\ Stock = \frac{Expected\ Dividens}{(k_e - g)}.$$

We have to acknowledge that there are other methods that try to work around the previous methods limitations, in particular when we are before firms in need of a higher flexibility in growth perspectives. We have two alternatives regarding Damodaran (2006), we have the two-stage growth model that in the first phase represents a bigger and an unstable dividends growth, in phase two there is a constant and stable growth and this is supposed to be in a long term perspective. Then, in accordance to Fuller & Hsia (1984), we have the H-model that in a first period shows a growth rate that will tend to decrease, reaching a constant rate in period two.

Reaching to Damodaran (2006), we find that are three main advantages in using DDM. Firstly, it is very simple and logical to use, secondly, to estimate future CF's, i.e., dividends, it's not necessary for several assumptions, lastly there is relative stability in dividends that differs from other types of CF's.

Free Cash Flow to Equity (FCFE)

Regarding Damodaran (2006), this model is not that different from DDM, although I will approach the main difference in the final part of this excerpt, FCFE is a model that takes into account potential dividends instead of concrete dividends. FCFE also represents all the CF left after the company necessities (investment needs or all payments concerning debts), being the CFs that will be available to repurchase of shares and dividends distribution. According to Damodaran (2002, 2006), the FCFE can be computed as follows:

(3) Net Income + Depreciation – Capital Expenditures (Capex) - Δ Non-Cash Working Capital (NCWC) – (New Debt Issued – Debt Repayments).

In accordance with Damodaran (2002), we can also use this FCFE in other models very much alike with the DDM to reach the price of a stock. Therefore we replicate the GGM substituting dividends for FCFE:

(4) $Value\ of\ a\ Stock = \frac{FCFE}{(k_e - g)}$.

Then we have the two - stage FCFE Model where the value of a stock will be the PV of FCFE plus the PV of terminal price.

(5) $\sum \frac{FCFE_t}{(1+k_e)} + \frac{P_n}{(1+k_e)^n}$.

This model is best to use when we want to do a company valuation, when we have M&A. The main difference about this model is purely the explanation CF, in DDM we consider CF as the expected dividends. Where as the FCFE considers being CF the part that is left after repurchase of shares and dividends distribution, as stated above (Damodaran 2002).

2.2.1.2. Firms DCF Models

According to Damodaran (2006), instead of evaluating a company by its E, as mentioned in the last section, we can do a valuation by the value of the entire company, i.e., Enterprise Value (EnV). If we discount the free cash flow (FCF) using the weighted average capital cost (WACC) we get the firm value. We also have another relevant model that is the Economic Value Added (EVA).

Free Cash Flow to Firm (FCFF)

Concerning Fernández (2013a), FCFF is the CF destined for shareholders if we have a company with zero debt, i.e., the operating cash flow (OCF) when you withdraw financial debt. This also means that the priority of this CF is firstly to debt and then to shareholders. In Steiger (2008), we can find the formula to reach FCFF:

(6) Earnings before Income and Taxes (EBIT) (1-T) + Depreciations and Amortizations (D&A) – Capex – Δ Net Working Capital (NWC).

We should take into account that if we are dealing with a company with no debt, FCFF will be equal to FCFE (Fernández 2007). Furthermore according to several authors like Miles, & Ezzell (1980) and Damodaran (2002, 2006) comment that this model should only be used when we want to evaluate firms that want to retain a constant Debt (D)/E ratio.

Therefore in accordance to Damodaran (2002), the company value is:

(7) $\sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+\text{WACC})^t}$.

But if we have a stable growth we have to add the terminal value (TV) (Damodaran 2006):

(8) Company Value = $\sum_{t=1}^{t=n} \frac{FCFF_t}{(1+\text{WACC})^t} + \frac{TV}{(1+WACC)^n}$.

To compute the TV we have to make a crucial assumption, the last known CF will have to grow in perpetuity, i.e., forever (Kaplan & Ruback 1995). Consequently, TV will be based on average growth expectations being the NPV of the future forecasted CF (Steiger 2008). Adapting a formula from Beranek & Howe (1990), from future dividends to future FCFF and considering the WACC rate, TV:

(9) $\frac{FCFF_t*(1+g)}{(WACC-g)}$.

To reach the same value as in FCFE valuations we use WACC, which is merely the rate that FCFF are discounted, representing the correct rate to use when it's decided to fully value the company (Fernández 2011, 2013a). The formula is given by Goedhart et al (2005a), stating that this rate consolidates k_e with the cost of debt (k_d), which one still has to extract taxes (T):

(10) $\frac{E}{E+D} * k_e + \frac{D}{E+D} * k_d * (1 - T)$.

We have to keep in mind that in accordance to Fernández (2011, 2012), WACC can't be seen as a cost or as a return, because, as stated before, its purpose is to unify k_e and k_d, becoming an average of both.

The next steps will be towards giving a brief explanation of the WACC components:

k_e

Relying on Damodaran (2002), it determines that k_e is considered to be the return rate that investors need. To find this rate we can use one of three methods: Capital Asset Price Model (CAPM), Arbitrage Pricing Model (APM) and Multi - Factor Model, even if the three need the same factors to be computed (Risk-free rate (R_f), market risk (β) and market return (R_m)) (Damodaran 2014).Therefore k_e is equal to expected rate of return of a stock ($E(R_i)$) (Goedhart et al 2005a) .Many authors like Damodaran (2002), Goedhart et al (2005a) and Steiger (2008) claim that the most respected one and efficient to compute k_e is CAPM. According to Goedhart et al (2005a) the formula for CAPM is:

(11) $E(R_i) = R_f + \beta_i [E(R_m - R_f)]$.

Additionally in Steiger (2008), is implied that this expected return will be the Return on Equity (ROE).

R_f

On Damodaran (1994, 2002), states that this rate should be chosen as a rate with no variations, i.e., you know exactly what's going to be your return, no default risk as no reinvestment risk. Thus we should choose a long term government bond as the R_f.

β

According to Damodaran (1999), β measures the risk that a different asset adds to a portfolio and the relative risk as well, i.e., market risk. Reaching to Goedhart et al (2005a), it's possible to observe that we can compute β with a linear regression of the market model:

(11) $R_i = \alpha + \beta R_m + \varepsilon$.

Nevertheless if we go through Fernández (2003), it's obvious that we can compute β using the unlevered β (β_u) to find the levered β (β_l), and for a firm with constant growth perspectives that want's to have a fixed leverage ratio the best way is to:

(12) $\beta_l = \beta_u + (\beta_u - \beta_d) * \frac{D}{E} * (1 - T)$.

Furthermore in Fernández (2003), a comparison is made with other ways to compute the β_l from other authors like Modigliani & Miller (1963), Myers (1974), Miles & Ezzel (1980), Harris & Pringle (1985) and Damodaran (1994), reaching to the conclusion stated in the previous paragraph.

Market risk premium (R_m - R_f)

According to Fernández (2012), the terminology for the (R_m - R_f) is vast, it can be known as the market risk premium, such as the title of this excerpt, equity risk premium which is actually the term he uses, market premium and risk premium. In Fernández et al (2013) and Fernández (2012), he describes four different terms:

- Historical equity premium which is simply the average differential return of the portfolio / risk-free debt;
- Expect equity premium that can be reached by doing surveys;
- Required equity premium that can be the main concept for reaching WACC;
- Implied equity premium is used in stock appraisal. To compute this we use the DDM, where the major difference in the results obtained will be because of the assumption in g, therefore it will always be different to all investors;

It can be extracted from Graham & Harvey (2013), two interesting conclusions, one that follows what some authors of this theme defend, that is the implied equity premium when computed by investigators, tends to be superior than the one got in the surveys performed. The second is that market risk premium will be higher in times of recession comparing when we are not.

k_d

In accordance to Steiger (2008), k_d is the rate associated to the firms unpaid debt, i.e., the interest that the company has to pay for borrowing money. This rate is associated to the score that rating agencies provide, if it's high the k_d won't be that much, the

opposite if it's low. Likewise there are two methods for reaching this rate, using the yield-to-maturity of a long term bond (Damodaran 2002), and according to an alternative method, using the spread related to the rating of the bonds plus r_f, which relying on the authors may be incorrect because it can lead to a high WACC (Cooper & Davydenko 2001).

EVA

Is nonetheless an extent of the excess made by a portfolio or an investor, it can be computed using the PV formula with k_e as discounted rate, when talking about present or future projects (Damodaran 2006). Since this method won't be approach in this ER this will be covered in a brief topic.

2.2.1.3. APV

On Sabal (2005), it's possible to observe that through Modigliani & Miller (1958, 1963) arise the APV method as a new type of company valuation, that according to Goedhart et al (2005a) the objective of APV, besides providing a valuation, is to divide the computations into two branches, one where it valuates the PV of Tax Shields (PV (TS)) to understand how much it can be gained with interests, and another part to do a valuation of the firm as it was all of it financed with equity, and finally it sums those two branches. According to Damodaran (2006), this method is almost perfect it only misses the effect of bankruptcy costs that we have to withdraw from the previous method, reaching to the following formula:

(13) $V_u + PV\ (TS)$.

Moreover Bence (2011) states that this is the only valuation method that discriminates the value of tax shield, being APV very suitable to firms in emerging markets with intricate legislation and where we don't have a specific need of having a fixed constant debt ratio (Sabal 2005) or in "high leveraged transactions where debt ratios varies" as it was assumed by Booth (2007). Some authors go further claiming that this the best method for company valuation because it doesn't present relevant errors when compared to WACC and that WACC only continues to be taught because it's standard pattern (Luehrman 1997a).

2.2.2 Relative Valuation

Relying on Damodaran (2006), it can be said that relative valuation acts somehow as benchmarking, basing the value of a company, in this case, according to the market. The rationale in this method is that in average if we gather a group of comparable companies we will reach a fair price by comparison, assuming we are in the presence of efficient markets. To accomplish this we have to follow three important measures:

- Find a group of comparable companies, even though many practitioners use normally companies from the same sector it doesn't necessarily have to be that way, it can be companies with the same CF's expectations, risks or g;
- Standardized prices, i.e., transforming the market value into comparable multiples like earnings, revenues or book value;
- Always adjust the companies differences through the process of relative valuation;

According to Fernández (2007, 2013a, 2013b) there are three types of multiples:

1. Based in EV, that are simple to reach, such as:
    a. Price Earnings ratio (PER) which can be computed by EV over Earnings;
    b. Price to Sales (P/S) being PER multiplied by Return on Sales (ROA);
    c. Price to Book Value (PBV) can be obtain by market capitalization over book value,
2. Based in E+D i.e., EnV
    a. EV to Earnings before Interest Taxes Depreciations and Amortizations (EBITDA);
    b. EV to EBIT;
    c. EV to sales;
3. Multiples that are related to Growth like PER/g and EV/EBITDA/g, but this type of multiples for the purpose of this ER will be discarded.

Although this is the method most used in company valuation, in part because they are easy to reach and understand, and according to some authors they should be viewed as complement to DCF valuation because they are very disperse and can cause some problems (Goedhart et al 2005b, Fernández 2013b). In accordance to Damodaran (2006)

those two methods sometimes can enter in conflict because they can produce two extreme valuations.

As stated by Lie (2002) and Fernández (2013b), that reach to same consensus, the multiples have to be used according to the sector that the firm performs in order to reach the most viable conclusions and better valuations.

2.2.3. CC Valuation

Concerning Damodaran (2002), in this kind of valuation we use option pricing model to value assets or even choices, because in DCF valuations they don't take into account that projects can be discarded or expanded, they consider that the project is inflexible and only allows for what we planned in the beginning (Copeland & Keenan 1998).

This method can lead sometimes to different values or decisions when compared to DCF methods, since it considers opportunities that may arise in the implementation of projects, this can be evaluated by models like Black Scholes or Binomial model, the first one even shares some inputs with DCF models, therefore it should be used as a complement to valuations (Luehrman 1997b)

2.2.4. BSB

According to Fernández (2013a) and Damodaran (2002, 2006), this method looks for the firm value by doing a valuation on its assets, neglecting growth perspectives, market situation and other angles that this method doesn't take into account. Furthermore there are three models that are inserted in this method which are: Book Value, Liquidation Value and in accordance to Damodaran (2002) replacement cost.

The first one uses the balance sheet (BS) to equal shareholder's equity to the company value, the second, liquidation value, considers the company value to be the value when all assets are sold and all creditors are liquidated. Finally replacement cost determines the firm value only when it's possible to know the cost that would take the company to replace all assets (Damodaran 2002, Fernández 2002).

3. VW Group

It was in 1904 that the first concept of Volkswagen emerged in a time that the most popular vehicles were motorcycles, since then the company faced numerous setbacks driven by the consequences of World War II passing the company from hand to hand and the macroeconomic environment. Even though the VW Group was able to grow and penetrate in strategical external markets, as represented in figure 1, throughout joint ventures and acquisitions, always being in the forefront of automotive technology. Going through necessary firm restructuring to adapt the company to adverse market conditions like the partly privatization of the company in 1961 and the conception of a financing division that along the years was renamed and reorganized reaching a sector division and a portfolio described in part 3.1.

The VW Group is well represented throughout the world in several regions like Europe, North America, South America, Asia-Pacific and Other Markets:

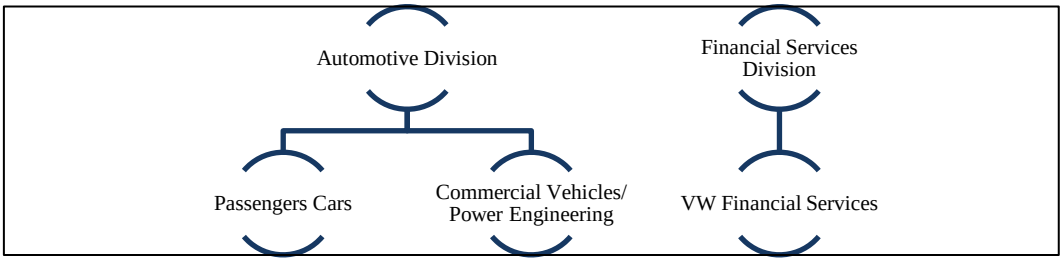
Figure 1 - Internationality

Source: VW

3.1. Organizational Structure of VW Group

The group is divided into two main categories Volkswagen AG which is the main company where the VW Group is inserted and the prime objective of the company is to produce new and more advanced vehicles and also components for all the automotive brands of the firm. In its essence the company it's divided into two main sectors:

Figure 2 - Work Sectors



Source: VW

Throughout the years VW has been growing, adding several types of automotive brands to their portfolio, becoming a group that holds different kinds of vehicles that goes from luxury vehicles, small cars, trucks and finishing with motorcycles in order to appeal to all types of consumers. The brands that VW holds inside of the automotive division are: Volkswagen, Audi AG, SEAT, S.A., SKODA AUTO a.s., Bentley Motors Limited, Bugatti, Automobili Lamborghini S.p.A., Dr. Ing. h.c. F. Porsche AG, Ducati Motor Holding S.p.A., Volkswagen Commercial Vehicles, Scania AB and MAN SE.

Moreover VW Group was recognized as the second best automotive group, when comparing revenues, by the Forbes 2000 The World's Biggest Public Companies in 2014, which can be seen as the growing reputation that VW enjoys among consumers.

3.2. Risks

As any other company, VW is exposed to a set of risks that may impair the daily activities of the group, thus to mitigate the risk the company resorts to three defence systems composed by an Operational Risk Management and Internal Control systems (RMS/ICS), the Governance, Risk and Compliance department (GRC) and lastly the Internal Audit department. In the present table we can observe the several risks that VW faces:

Table 1 - Risks

Risk	Damage	Measures to Mitigate Risk
Currency risk	As any other international company exchange risk affects in many ways since they deal in several currencies.	Natural hedging creating production facilities in the major countries. Use of currency forwards, currency options and cross-currency swaps.
Interest rate risk	Many firms can have their results affected by the rise of interest rates, especially rates that are indexed to other reference rates. Thus Group rating and interest rates fluctuations can be a problem in the results.	Hedging the interest risks with derivative and non derivative instruments like cross - currency swaps and interest rate swaps.
Liquidity risk	In nowadays economy obtaining credit can be challenging, but some of the major players like the VW Group don't have that problem.	The Group has no constrain in raising capital in all markets kinds. They only resort to banks when in need of covering short term needs of WC.
Counterparty risk	When concentrating a big part of its liquidity in investments, the firm sometimes may face this risk, since the other part may not rise to his responsibility.	Therefore Volkswagen Group has a specialized department to deal with this risk, the counterparty risk department and also another measure to prevent this risk is to diversify their investments.
Geopolitical risk	Many times firm's results can suffer some setbacks due to political changes or instability in a country.	This risk can be dealt with diversification, so that the company won't be too dependent on a single country, thus VW spreads their investment or production facilities.
Demand risk	Currently there are some markets where the automotive segment is saturated which can have a deeply impact in profits.	The Group is well aware of the changes in the demand, as a result they are constant upgrading their vehicles and using alternative fuels to meet the current environmental regulations.
Quality risk	Since the Group enjoys a great reputation, their vehicles possess high standard quality; therefore it's a risk to have flaws in their products.	To face this risk, of selling a vehicle with a tiny flaw, VW runs a series of default tests to identify, in a short period, the errors using internally-test risk management systems in order to assure quality.
IT risk	When developing brand new technology the company has to protect their software's to ensure an advantage over their competitors.	The firm fights this risk by staying in the vanguard of firewall software and dual verification procedure also VW limits the access to the minimum necessary as the same goes to copies that are stored in secure places.

Source: VW

3.3. Strategies to Ensure Future Profitability

In order to guarantee the future financial success and international reputation of the group, the company has developed a set of long term measures to attain the desired objectives. Therefore the company acts in four different pillars considered to be of the upmost importance:

- Employability;
- Customer excellence;
- Sales improvement;
- Enhancement in the return on sales (ROA).

To assemble the finest vehicles it is necessary to have the most expert employees in the market and to attract them the VW Group relies on an attractive remuneration pack with Post-employment benefits, Bonus, Long Term Incentive and in international reputation that the company enjoys.

Improving their vehicles with more adaptations and expanding to growing markets the company will be able to attend the more informed and demanding clients assuring their satisfaction.

Continuing the enlargement of the group to growing markets with a vast range of vehicles will allow the firm to reach the so craved long term target of selling 10 million vehicles yearly.

Improving the ROA index is a process of financial sustainability that the majority companies that want to be leaders in their sector go through; consequently the VW Group has as a goal to reach a ROA bigger than 8%, 2.5 points up than the current expected for 2014, 5.5%.

4. Stock Market Performance, Dividend Policy and Shareholder Structure

As emphasized in the Literature Review chapter, one of the income that investors have are dividends, consequently this led us to the rationale that we, investor, buy a stock in order to receive a dividend. Therefore it's of the utmost importance to analyse the company performance in the stock market, dividend policy and lastly the shareholder structure.

4.1. Stock Market Performance

Although VW is present in many indexes the international presence is confined in five international stock exchanges Basle, Geneva, Zurich, Luxembourg and New York the most ancient ones were all in Switzerland in 1967 , and seven national Berlin, Dusseldorf, Frankfurt, Hamburg, Hanover, Munich and Stuttgart all of them since 1961

time of the partially privatization.

For the importance of this MFW the analysis will be focus on the Group performance, include a comparative analysis with Dax 30 and also an appraisal against the other players in the same sector. The timeline of this analysis will be comprehended between 02-01-2006 and 31-12-2013 the reason for this timeline is to observe the behaviour of the company and its competitors in the stock market, before, during and in the financial crisis recovery. The next table presents the VW and its direct competitors, annual and total sample share price evolution with data gathered from DataStream:

Table 2 - Share Price Evolution

	Volkswagen Group	Toyota Motor	Hyundai Motor	Daimler	General Motor	BMW
02/01/2006 - 29/12/2006	64.48%	14.19%	-40.64%	6.86%	n.a.	15.18%
01/01/2007 - 31/12/2007	59.87%	-31.48%	-4.92%	34.42%	n.a.	-2,02%
01/01/2008 - 31/12/2008	46.93%	-47.27%	-84.12%	-91.95%	n.a.	-66.52%
01/01/2009 - 31/12/2009	-118.35%	23.14%	116.64%	34.21%	n.a.	37.61%
01/01/2010 - 31/12/2010	32.76%	1.84%	45.32%	31.48%	8.90%	60.69%
03/01/2011 - 30/12/2011	-8.29%	-13.87%	19.16%	-42.88%	-57.45%	-17.35%
02/01/2012 - 31/12/2012	43.00%	31.33%	8.56%	16.34%	33.68%	32.02%
01/01/2013 - 31/12/2013	18.94%	23.26%	4.93%	42.04%	30.48%	15.69%
01/02/2006 - 31/12/2013	**148.09%**	**0.84%**	**67.84%**	**36.41%**	**16.54%**	**82.53%**

Source: DataStream

4.1.1. VW Groups Price Performance

In the table it's possible to observe that in the sample VW shares enhance almost the double of the other big competitor BMW in spite of that there were two bad years for the Group 2009 and 2011, the first one is due to information leakage that Porsche Automobil Holding SE would increase its voting rights and Qatar Holding LLC becoming third major shareholder brought volatility to the stock market, on the other hand 2011 appears to be a ruthless year for the car industry excluding Toyota motor, the company faced the uncertainties of the market and as all automotive companies the Group suffered from the political instability in the North African region. For a 2008 onward chart analysis, resort to appendix 1.

4.1.2. Comparative Analysis with Dax 30

In the appendix 2 it's patent, most times, that VW outperforms Dax 30, and even though Dax 30 is composed by several companies therefore it is diversified when compared to only one company. But we are comparing the index with a very stable company that is

VW that along times has proven that can adapt through circumstances and create new strategies to face the problems that are present in the automotive sector.

4.1.3. VW Groups VS. Direct competitors Price Performance

When comparing VW with other companies present in the table it is clear that in the sample first years VW distances itself from their competitors, share price compared, but between 2008 and 2009 their value decreases to market levels (see appendix 1). In 2009, when all companies are at somewhat the same level, it's possible to see that Toyota Motor, Daimler and BMW are bellow Hyundai and VW share price.

Through times Hyundai as been enjoying some positive results that is positioning the company as a profitable one and attractive to the investors competing with VW. Finally there is General Motors (GM) that as a company that origins from another that filled for bankruptcy doesn't have the credibility from the investor's side.

4.2. Dividend Policy

In order to attract investors the pay-out ratio as to be attractive, consequently the mid term target for the Group is to reach a ratio of 30% but currently is in 20.6% growing every year. The amount of dividend varies from ordinary to prefer shares, in 2013 the amount paid for preferred shares was €4.06 and for ordinary €4, 50 cents more than the previous year, which can be seen as a 2% dividend yield. The strategy behind this is to ensure that the interests of investors for an active participation in the positive accomplishments of the business.

The earnings per share (EPS) in the fiscal year of 2013 was €18.63 on ordinary shares were on preferred the value was up €18.69, this value can be attained by dividing the profit of the VW AG shareholders by the weighted average of the total outstanding shares (preferred and ordinary) during the concerned period, however this value is much less than the EPS from last year because the value created in 2012 of the Porsche incorporation had a very positive effect.

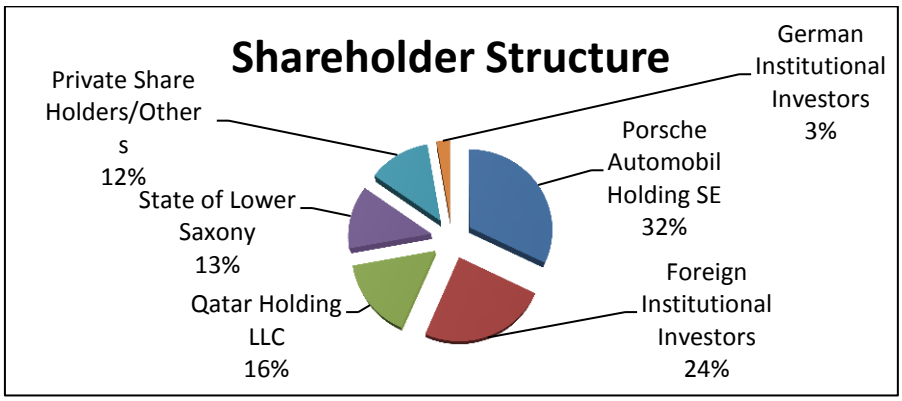
4.3. Shareholder Structure

In December 31, 2013 the Group accounted for 465,237,989 outstanding shares divided in 170,148,171 preferred shares and 295,089,818 ordinary shares where the subscribed

capital represents €1,191,009,251.84.

The Shareholder organization it's divided in three major players that have voting rights, but in its fullness is composed by 6 different main participants as can be seen in the next chart:

Chart 1 - Shareholder Structure



Source: VW

As previously mentioned the voting rights are divided by Porsche Automobil Holding SE that holds 50.73%, State of Lower Saxony with 20% and Qatar Holding LLC with 17% the final lacking part of the voting rights are distributed to other shareholders and amount to 12.3% of the voting rights. It can be retrieve by this graph along as the voting rights that the majority shareholder is Porsche Automobil Holding SE whose it belongs the responsibility of approving or reproving the initiatives debated in annual reunions.

5. Macroanalysis, Operational & Financial Framework

5.1. Macroanalysis

Since VW Group is an international Group instead of doing a detailed macroanalysis of all the countries that VW is present, this sector will show an analysis of those regions that are emphasized in the Annual Report (AR) 2013.

Currently, according to the VW Group AR (2013) the global growing still is inferior to the last year. But yet the difference is of 0.1%. It is known that the economic position of the majority industrialized and developed countries are slightly improving much due to the intervention of the Central Banks. Nevertheless there still is some constrains waging this growth.

Europe

Overall in all Europe the growth is somewhat stationary, we are before an era with little growth some countries are even in recession, which has tremendous impact in the employment rate that continues to rise being in its average 12.6%.

From data observed in Eurostat, inflation rate due to measures taken by the European Central Bank (ECB) the average rate was bellow the 2% imposed, it was 1.7%.

In terms of GDP for the Euro Zone there is no growth actually, in 2013 it was negative(-0.4%) which is quite alarming, in some of the more stable countries as Germany were the conditions are meet to boost the GDP the opposite happen it is still decreasing.

North America

According to The World Bank the inflation for US in 2013 was 1.47% less than the previous years due to the stabilization of the economy and the FED incentives. But we can't verify the same on exchange rates the dollar was very volatile against the euro. In GDP There was also a decreasing trend when compared to 2012, in 2013 the GDP stabilized in 1.9% even though the employability is up in 2013. On the other hand in Canada GDP growth is 2.0% in 2013 rising from 1.7% in the previous year according to The World Bank. In Mexico the evolution of GDP was negative decreasing from 3.8% to 1.4% that can be explained by the reduction investment and the diminution in the demand, it is expected that the GDP in 2014 to grow, reaching, almost, the values of 2012.

South America

The important countries of this region are Argentina and Brazil because of the growth expectations that these two countries face. Relying on the World Bank the Argentina GDP growth had a huge drop from 2011 until 2012 reaching to 1.9% but in 2013 there was a recovery rising the levels to 5%. Brazil was able to recover and reach the GDP growth of 2.2% along the years there has a deceleration of this country economy, most of the government economic incentives failed nevertheless this is a stable country that is benefiting from a steady growth the idea is to attract foreign investment.

Asia-Pacific

In China there is a positive growth stabilizing the GDP growth in 7.7% this is a country

that is going through a fast economic growth and needs to work on people inequality. In Japan almost the same thing is happening they are experiencing a growth with their GDP being above the world average also the inflation is 0.4%. In India there was a slight growth of the GDP reaching 4.6% in 2013, this growth could bigger if it weren't for India structural problems and weak investment rates since it's a country that the majority of its habitants live in poverty or in extreme conditions with hygiene deficit and poor conditions.

5.2. Operational Framework

In operational terms the company has been very successful, despite the turbulent times that the automotive industry faces. The group continuous to present solid, consistent and positive results rising their sales, expanding their product portfolio and helping the global economy by adding employees to their work force. To observe the year to year variation of the previous mentioned factors see appendix 3.

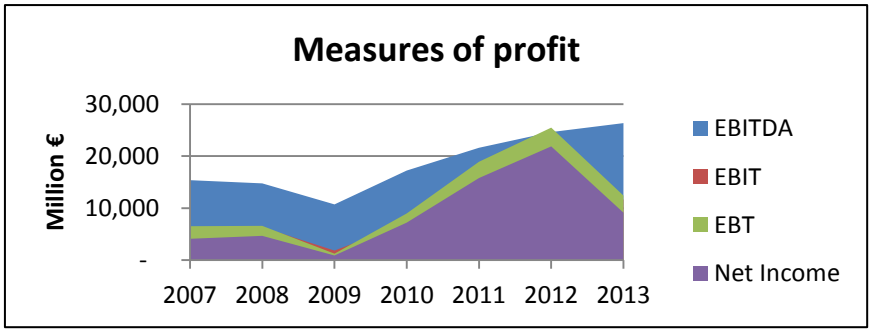
Table 3 - Variation of produced and sold units and employees

Δ Through the sample years	Δ 2013-2012 %	Δ 2013-2007 %
Number of sold vehicles	4.11%	57.12%
Production	5.10%	56.56%
Employees	4.19%	73.94%

Source: VW

Actually with the exception of 2009 the group presents a positive variation on the most significant measures of profit, rising their net income almost every year even though there is a tendency for the costs to rise as well. Nevertheless this last year, 2013, gave rise to a decrease in the net income due to a poor performance of the financial function when comparing to other years.

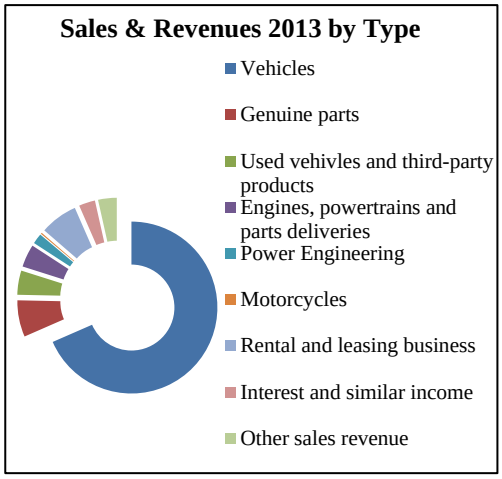
Chart 2 - Measures of profit



Source: VW

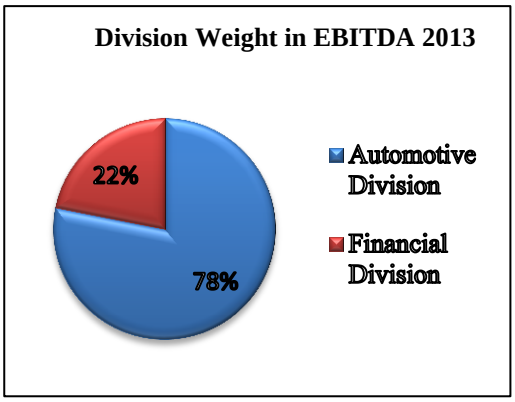
In appendix 4 is possible to consult the 2007 until 2013 financial statements used.

Chart 3 - Sales & revenues discriminated



Source: VW

Chart 4 - Division Weight



Source: VW

In chart 3 it's possible to observe the number of products and services that the group offers in 2013, with an offer that continued to expand since 2009. The top 3 products are vehicles, rental and leasing business and genuine parts, with a weight in sales of 68.44%, 6.88% and 7.08% respectively. To consult the dollar amount of each unit and their weight consult appendix 5.

In chart 4 it's clear that the core business of the VW group is the automotive division, furthermore it is obvious that the positive results depend exclusively of this division performance, actually in 2008 the financial division dragged the results down. To consult "reaching EBITDA statement by segment" see appendix 6.

Table 4 - Income statement (IS) variation

Δ Through the sample years	Δ 2013-2007 %
Net Sales	80.91%
Cost of Sales	74.30%
Gross profit	118.49%
General Expenses	345.60%
Other income	66.10%
Other expenses	66.51%
EBITDA	73.06%
D&A	61.74%
EBIT	89.73%
Financial Gains	388.83%
Financial Costs	43.66%
Other Financial Results	-64.37%
EBT	89.93%
T	35.65%
Net income	121.81%

Source: VW

Even though the net income of 2013 was less than 2012, when comparing with the first year of analysis (2007) we can still see a very positive variation which indicates to us that spite the global turmoil the group has been very successful, particularly when considering the industry where the company is positioned. To see the variations year by year see appendix 7.

When observing the profitability ratios from 2008 until 2012, with exception to 2009, there is an upward trend, which is the opposite of 2013 due to problems stated in a previous paragraph. In 2013 ROE is 10.15%, ROA is 2.82% and RS is 4.64%.

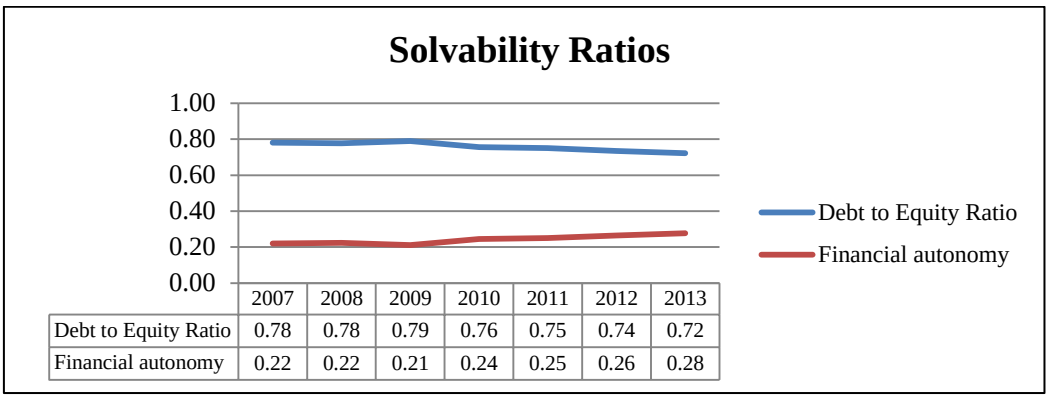
In appendix 8 is possible to consult the yearly evolution of other operational ratios and indicators such as: Capex, EBITDA-Capex, Net Debt, WC, WCN, Liquidity total amount and its ratio and finally the three profitability ratios mentioned in the previous paragraph.

5.3. Financial Framework

Starting with financial autonomy, this ratio show us how much the company is exposed to external capitals, if it is presented a low ratio it means that the company depends highly on external capital, which is the case since the group presents a consistent ratio through out years that varies within 0.21-0.28, despite being growing in the last years it is still low.

The D/E ratio express how much the company depends on external lenders, this ratio complements the previous one, and it presents high values meaning that the company indeed depends at this point on external lenders.

Chart 5 - Solvability



	2007	2008	2009	2010	2011	2012	2013
Debt to Equity Ratio	0.78	0.78	0.79	0.76	0.75	0.74	0.72
Financial autonomy	0.22	0.22	0.21	0.24	0.25	0.26	0.28

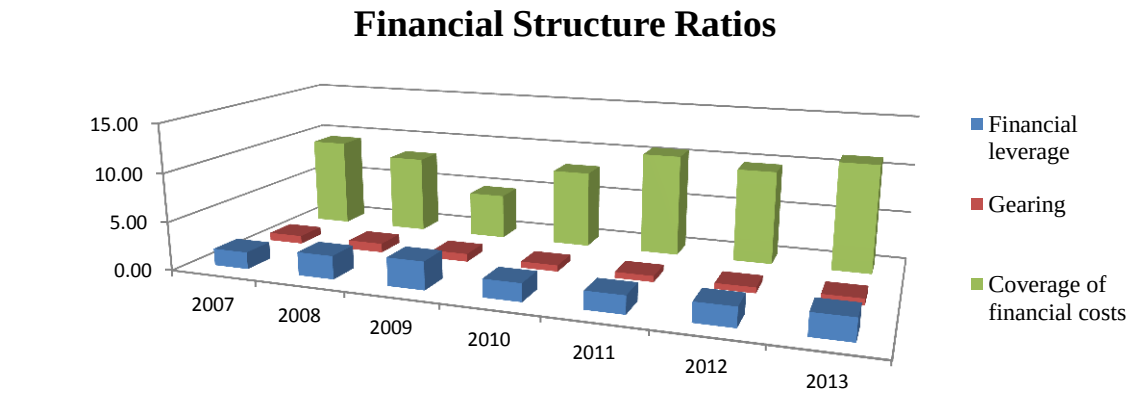
Source: VW

In a Financial structure gathering it seems that the three most important ratios should be financial leverage, gearing and coverage of financial costs. The first one shows, according to IAPMEI (2001), the capacity for the company to pay finance duties to creditors, when this value is presented has a low value the company is able to pay its creditors and on top of that can refinance itself at more attractive rates in the market if need to be, which seems to be the case of the VW group.

Gearing is just another measure of financial leverage that demonstrates how much of the company is financed with lenders instead of stakeholders, if this values reaches to 1 or close, it means that the firm is in a very risky position because it means that the company is covered by debts, but this depends form industry to industry. In the case of VW, in the last two years they have made an effort to keep this value down so it can be in a stable financial position.

The last ratio represents the ability for a company to pay their financial costs, therefore having high values on this ratio is positive equalling to the number of times that the company is able to pay this costs. Consequently is more than obvious that the group has the situation more than controlled.

Chart 6 - Financial Structure



	2007	2008	2009	2010	2011	2012	2013
Financial leverage	1.76	2.40	2.89	1.85	1.83	1.98	2.24
Gearing	0.85	0.95	0.83	0.65	0.63	0.60	0.66
Coverage of financial costs	9.34	8.14	4.73	8.04	10.56	9.67	11.14

Source: VW

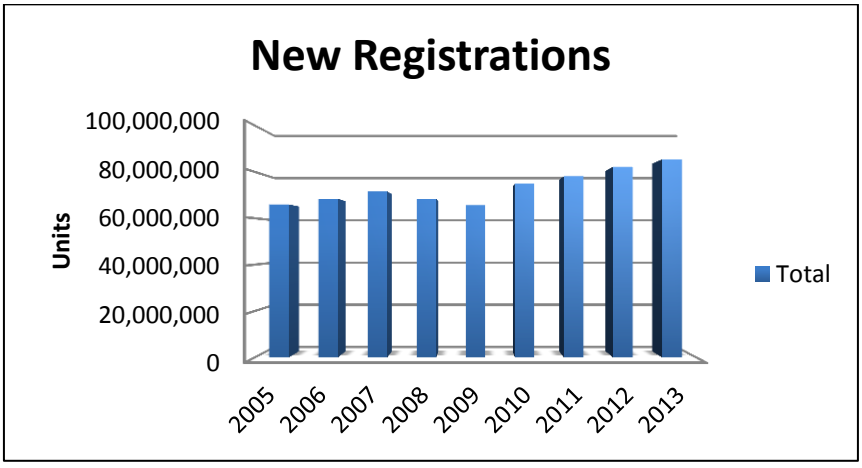
6. Industry and Competitors Analysis

6.1. Industry Analysis

According to Humphrey & Memedovic (2003) this industry is one of the more globalized of all others. Despite the statement that there are only a few companies that rule the sector is common fact that is a market with many players, making it a very competitive sector. In the 1990's there was an upward trend due to the buying power that the emerging countries brought to the table but the overproduction from the companies, large offer and the increase in the price of fuels would lead to a disturbing trade crash in 2008, that in accordance to Levchenko et al (2010), the sector more affected was the automotive one which severally accentuated the bad economy of Europe, Asia and in practically North America that relied heavily in the automotive manufacture.

Nowadays, according to the VW Group AR 2013, the performance from car markets was poor and volatile due to the fact that many countries are still affected from the debt crisis, and they are still trying to rebuild the past economic position that they had. What boosted the market was the positive performance of the growing countries (Brazil and India) and some recognized potency countries (Russia and China). Nevertheless the global demand for all vehicles has been increasing in 2013 as we can see in the following chart:

Chart 7 - Total Registrations for all vehicles 2005-2013



Source: *Organisation Internationale des Constructeurs d'Automobiles* (OICA)

What can be observed in the chart is the effect that the debt crisis had between 2007

up to 2009.

Europe

In Europe, with the exception of Turkey and Spain, the growth was thanks to the government incentives; there was a downward trend in the demand through out 2013, as said in the previous paragraph this still much due to the debt crisis.

Western Europe reached its lowest point in twenty years (-1.9%), on the same page Central and Eastern Europe had a negative demand comparing to previous years, even Russia, the biggest passenger car market had a decrease in demand (-5.7%). In Germany the demand for new cars continues to decrease but the demand for used cars gain positive expression, signs that there is, to some extent, an economic recovery.

North America

Thanks to the encouraging financing measures accessible for the North American population the demand and new registrations grew to levels only seen previous to 2007.

South America

Didn't have as much as the weight obtained in past years but still had a positive impact, the government incentives weren't so effective as last years in Brazil but on the other hand, despite a decrease in demand, car exports were larger. On the other hand is Argentina were the demand of passenger vehicles grew 8.9%.

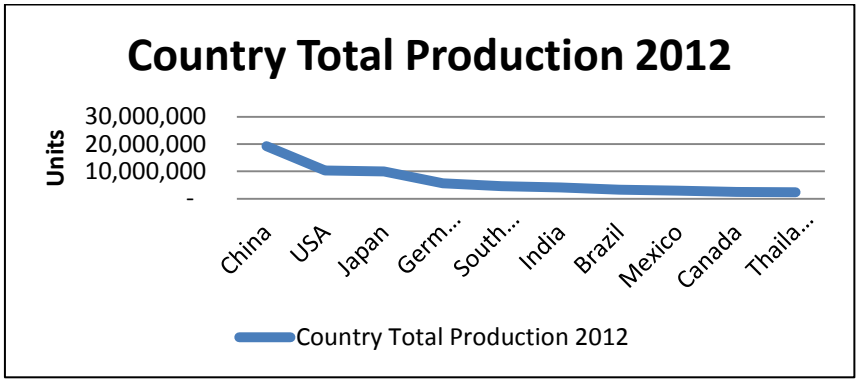
Asia-Pacific

Contributing positively tot he demand of passenger cars was this region behind China's driving force, growing to 15.8 millions vehicles. As for Japan it continues to perform on the same level as the past year. The reverse happened in India because of the high fuel prices the demand for new cars was decreasing.

A highlight should be given to South Africa since it contributed to improve the panorama, for some consecutive years the market grew, increasing 3.4% for new registrations.

In the next chart it is possible to observe the countries that contributed the most to vehicle production in 2012:

Chart 8 - Total Production 2012



Source: OICA

The conclusion that can be withdrawn from this chart is that the strategy from VW to partner up with Chinese joint ventures is wise since the production is in its majority there.

The future for this industry is still at a slow pace, emerging countries will still play a key role in company results, and nonetheless there are countries that will probably have a faster growth like Russia, USA, Canada and Mexico, according to VW.

Relying on the KPMG's Global Automotive Executive Survey (2012), developed countries are turning to other measures since there is a stress to look for alternative types of energy efficiency like vehicles running on electricity which exist but they aren't that cheap and there isn't still enough government incentives to drive them. In this matter there will have to be a lot of technology advancements and innovations for companies to reduce production cost or to be more cost efficient for the customer. Furthermore the path will be through joint ventures since this is a competitive industry with overcapacity and too much offer that will always represent a concerning problem.

6.2. Competitors Analysis

As it was said in section three. , VW Group is the second biggest automotive company, therefore as an ambitious company they aim for the top hence the biggest competitors are the most profitable automotive company Toyota, the third most profitable Daimler, the fourth Hyundai Motor Company, BMW the home country biggest competitor and GM for the role played in the history of the automotive industry, in the next table it is possible to observe the main characteristics of the these players.

Table 5 - Competitors

Company	Main aspects
Toyota Group	• Market leaders, by developing a plan in 2010 to gather 14% of market share; • Their core industry is the Automotive Business, their secondary businesses are: Housing, Financial Services, e-Toyota Business, Marine and Biotechnology & Afforestation.
Daimler	• Present in the genesis of modern car history; • High end brands: Mercedes-Benz and Smart; • Commercial vehicles: Freightliner, BharatBenz, Thomas Built Buses, Western Star, Setra and Fuso.
Hyundai Motor Company	• In 1998 it acquires Kia Motors; • In the last years have been presenting great results, becoming one of the most profitable companies in this industry.
BMW	• Despite what most people think the firm actually start by producing motorcycles; • This Company makes a clear distinction from the rest of the sector, providing only premium products and services; • Their premium portfolio is composed by: BMW, MINI, Rolls-Royce Motor cars and BMW Motorrad.
GM	• Filled for bankruptcy in 2009; • In 2010 to raised from the setback being the world biggest IPO i.e. Initial Public Offer; • Have a brand portfolio that contains: GMC, Cadillac, Chevrolet, Buick, Opel, Holden, Vauxhall, Wuling Motors Baojun and FAW-GM, several of these are Chinese joint ventures.

Source: Toyota Group, Daimler, Hyundai Motor Company 2013 Annual Report, BMW and GM

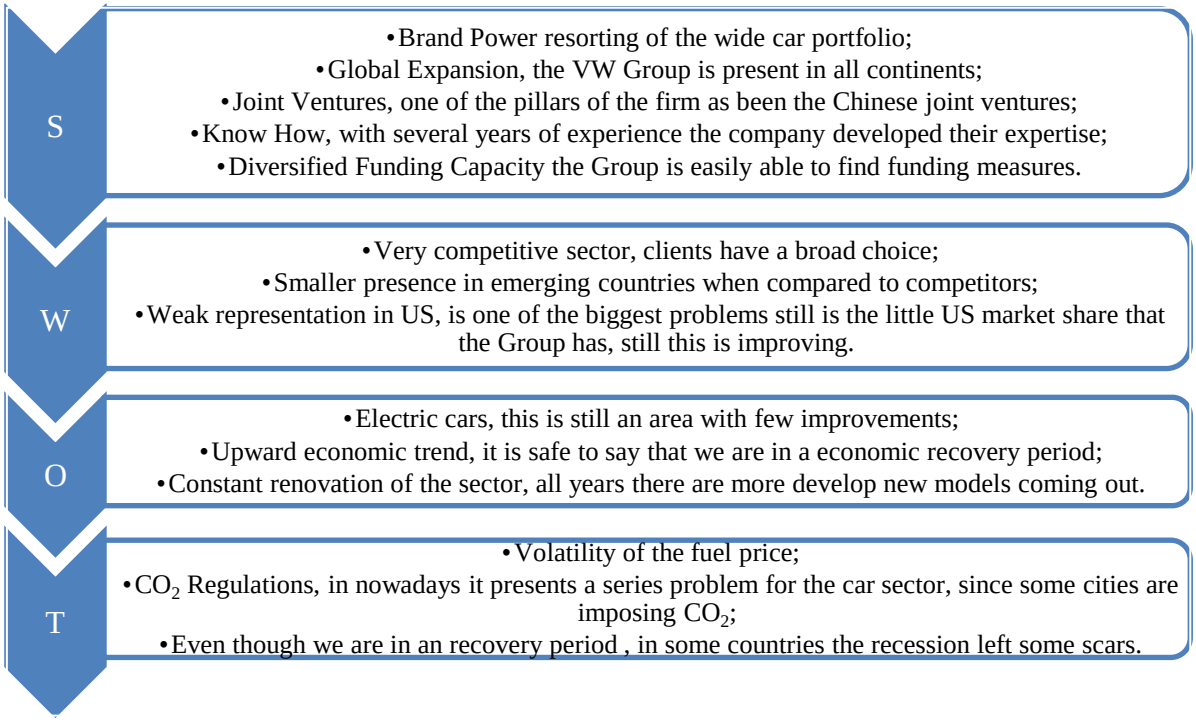
7. Strategically Analysis

7.1. SWOT Analysis

It's common for companies when presenting a project to prepare a Strengths Weaknesses Opportunities Threats (SWOT) analysis to better understand where the firm is positioned relative to the external and internal surrounding being able to recognize

future intervention fields.

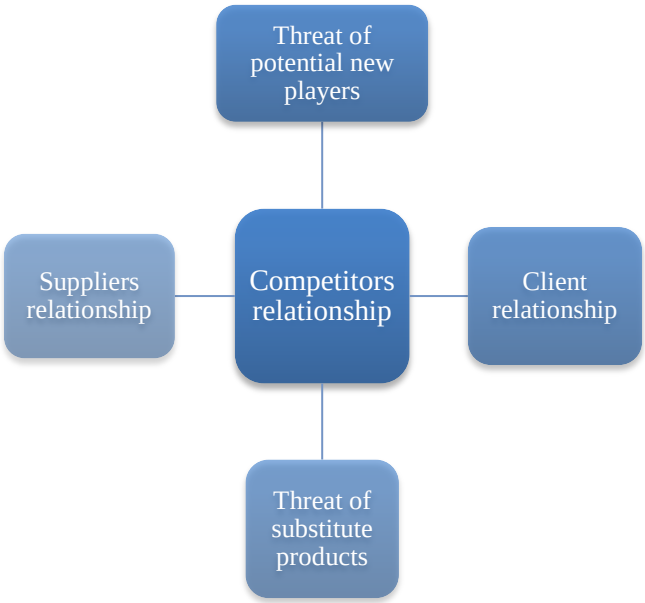
Figure 3 - SWOT Analysis



Source: VW

7.2. Porter Analysis

Figure 4 - Porter 5 forces



Sorce: Porter (1998)

This analysis is usually crossed with the SWOT analysis, and it can be helpful for managers to know where the company stands along their sector.

7.2.1. Threat of potential new players

When observing the threat of potential new players competing with VW Group we note that this sector isn't favourable at new players entry or start ups, since it takes a tremendous amount of capital to step up a manufacture of vehicles and even more to grow it to the size of this Group.

Legally speaking it is also very hard to meet and fulfil all the bureaucratic aspects as it is a sector guarded by several entities that demands the enforcements of many environmental rules.

Also this isn't in nowadays the most attractive sector since clients are demanding and with the past crisis devalued this industry with many companies fighting to present positive results as VW.

7.2.2. Threat of substitute products

Considering both threats that are presented in this model, this one is by far the most troubling in this industry. Where before a very wide and competitive sector, that can only benefit the client since it has many vehicles from other competitors to choose from, or services that provide the possibility of vehicle like leasing or renting. Therefore the menace can be of two different types, on one hand are other companies that sell the same products, in this case passenger cars and commercial vehicles, on the other hand we have service companies that grant leasing's and renting's.

7.2.3. Suppliers relationship

Its common practices for the Group to honour their long term suppliers, maintaining a loyal relationship with them, also since 2006 the company created a program to raise, in their relationship with the suppliers, social and environmental awareness.

To some extent it can be perceived as a risk, because up to 60% of the pieces to manufacture vehicles come from suppliers. Therefore VW relies on the quality of their providers. But either way they can be replaced when the Group feels that their suppliers represent a risk, which another of the objectives of the 2006 program is to identify risks and find solutions for them.

7.2.4. Clients relationship

Security, quality and price are the main pillars for the client's choice of products/services, since this is a competitive sector there are a lot of other choices for the client which enhances the client bargain power.

7.2.5. Competitors relationship

As said many times before, the automotive industry is a competitive sector with all the major automotive groups doing their best efforts to sell more cars then their competitors, satisfying their clients to maintain a broad base of loyal clients and at the same time gathering new clients. All this in order to prosper and became the leading automotive group.

Hence there is a deep rivalry between competitors. Once again it benefits the clients leading them to have the opportunity to choose the most suitable car to their needs. (To see VW main competitors go to point 6.2).

8. Valuation Assumptions

When doing a firm's valuation it is inconceivable to consider fixed and concrete values. In a valuation there are some unknown values or a value that an intangible asset can bring to a company. Hence it's important to assume from the outset some assumptions inherent to the sector and the company.

Table 6 - Assumptions

Assumptions Summary		
Number	Object	Assumed Value
Assum.1	Risk free	1.93%
Assum.2	β	1.32
Assum.3	Market Risk Premium	5.50%
Assum.4	K_d	2.4%
Assum.5	π	1.43%
Assum.6	g	1.25%
Assum.7	BS growth	12.05%
Assum.8	tc	28.5%

Table 6 show us the abbreviated gathered assumptions to start the valuation .The first one is the rf which was retrieved from the German Government Bund with a 10 year

maturity being this the closest to a risk free asset. β was picked up from the 2013 Volkswagen AR as was K_d, g and the tax rate. The Market risk premium was obtained in the paper of Fernández et al (2013). In order to compute the actual growth rate was decided to use the German inflation rate (π). All the data, for coherence reasons was gathered with the 12/31/2013 date.

To compute the forecasts a realistic growth rate was needed for the BS and the IS. Consequently a yearly growth variation since 2007 until 2013 was computed, rubric to rubric, to reach an average rate. From that point forward an outlier search was done using upper and lower limit formulas to see witch rates should be taken off so it wouldn't compromise the average rate. In the IS was possible to use a different average rate for all the rubrics, but in the BS to not jeopardize the rule of assets equals the sum of equity and liabilities, an average from all the averages obtained was computed, by once again resorting to the outliers system, and used in the five year forecasts.

9. Valuation

The methodology used to value the VW group was the Firms DCF model, computing the FCFF and then retrieving the WACC rate. Furthermore a valuation using the multiples model was done, to provide an idea of VW group price when comparing with their biggest competitors.

9.1. Firms DCF model

As it was said in chapter 2 this is one of the most used methods and in this case makes sense since the firms maintain a D/E ratio that doesn't fluctuate that much.

With the gathered data the K_e computed was 9.19%, and the WACC was:

Table 7 - WACC rates

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
5.54%	5.79%	6.22%	6.30%	6.39%	6.22%	6.22%	6.22%	6.22%	6.22%	6.22%

From 2013 forward the WACC rate is constant because we are dealing with a stable company, with no prediction of a big investment in the next five years and with a controlled debt, and if we look closer this value doesn't deviate much from the average.

When considering growth it is clear that one has to take into account the inflation of the current year (1.43%), therefore the actual growth will be equal to 2.70%, from this point

onwards every computations in this specific valuation part will be considering "actual growth".

To advance in the valuation we need to resort to formula (8), and the first thing is to compute the TV, the next table presents the variables used to compute TV, which the result was 100,993 million €.

Table 8 - TV

FCFF2018(provisional)	3,462
(1+g)	1.0270
WACC-g	3.52%

FCFF in Million €

Once the computation of the TV is completed we are now able to compute the total value totalling the PV of all FCFF attained from 2008-2018.

Table 9 - EV

Net Present Value	137,112
Cash and Investments	23,178
Non-operating assets	16,203
Non-operating liabilities	47,323
Firm Value	177,460
Non controlling Interests	2,304
Total Debt	81,122
Equity Value	***94,034***

In Million €

Using two types of assumptions one can reach price target between 199.52 and 202.61, the assumptions that vary were closing price and Market Capitalization.

Table 10 - Target Price

	2014 data	2013 data
Market Cap	85,420,000,000	92,800,000,000
Last Price	184.05	196.9
Shares Outstanding	464,113,013	471,305,231
Target Price	***202.61***	***199.52***

Source: VW and Bloomberg

For coherent purposes in this valuation it will be considered 199.52 to be the correct price target since these assumptions are known in 12/31/2013, the others were collected in 06/17/2014. To observe the detailed valuation steps go to appendix 9.

Nevertheless to observe the susceptibility of the target price to some variables a sensitivity analysis was performed to EBITDA, Net Sales g, BS g, g, π, π & g, β, WACC and K_e & K_d. What was discovered was that the target price is very sensitive to variations in the Net Sales g, WACC and π & g. To check the full extend of the sensitivity analysis go to appendix 10.

In Chart 9 it is clear that 0.05% less leads to a decrease in the target price comparing to the 199.52, as for an increase of 0.11% leads to a big valuation of 237.14. This small variation in percentage shows how much the target price is sensitive to this variable. As for the target price being sensitive to the WACC rate, it makes sense that with an upward trend in it, a piece of the target price is taken out since we are dealing with a capital cost rate. Finally in table 11 we can observe that if the two rates increase we can see a positive appraisal in the target price, if not it's the other way around, it means that this rates contributes for the growth perspectives as the own nomenclatures elucidates.

Chart 9 - Target Price sensitivity to Net Sales g

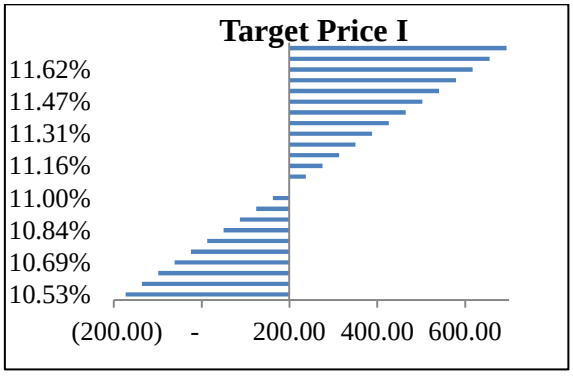


Chart 10 - Target Price sensitivity to WACC

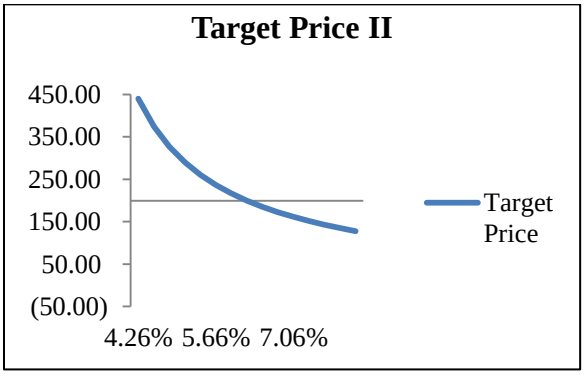


Table 11 - Target Price sensitivity to π & g

		π						
	199.52	*0.74%*	*0.97%*	*1.20%*	*1.43%*	*1.66%*	*1.89%*	*2.12%*
	0.00%	140.94	145.55	150.59	156.12	162.20	168.92	176.41
	0.25%	146.01	151.11	156.70	162.86	169.67	177.26	185.76
	0.50%	151.60	157.26	163.49	170.39	178.09	186.71	196.45
	0.75%	157.79	164.09	171.08	178.88	187.63	197.51	208.77
	1.00%	164.67	171.75	179.64	188.51	198.53	209.97	223.13
g	*1.25%*	172.38	180.37	189.35	199.52	211.13	224.51	240.10
	1.50%	181.06	190.15	200.46	212.24	225.84	241.70	260.44
	1.75%	190.92	201.36	213.31	227.11	243.23	262.32	285.28
	2.00%	202.21	214.32	228.32	244.70	264.13	287.54	316.28
	2.25%	215.28	229.47	246.11	265.86	289.71	319.06	356.08
	2.50%	230.57	247.44	267.51	291.78	321.73	359.60	409.03

9.2. Relative Valuation

In this method the chosen companies to operate as benchmark were all the competitors mentioned in part 6.2. Therefore an average will be computed from all the companies and compared with the Group ratios. The ratio considered were the ones used in table 12, being most of them the most used in this method and others in this industry.

Table 12 - Multiples

Company	PER	PBV	P/S	P/CF	P/FCF	EV / EBITDA	EV / EBIT	EV / Sales	Dividend Yield
Average	12.15	1.39	0.002	10.73	-5.85	7.89	13.66	1.02	2.33%
Volkswagen AG	10.53	1.04	0.001	4.96	12.12	5.85	13.22	5.85	2.00%

Source: VW and Bloomberg

Since PER is lower than the average it can mean two things, one is that it will take less years to the group to pay their investors. The other is that the company may be undervalued, thus comparing their stock with the sample stocks it becomes much more attractive to own VW group shares.

According to Neves (2002) the PBV ratio does a comparison between the values at which the company is listed with the accounting value of equity. Being that value under the industry average is easy to see that, once again the company is undervalued.

Again, not for much, the company is undervalued since P/S is lower than their competitors.

Since we are not dealing with negative P/CF is safe to assume, from the sample gathered, that these companies don't face solvency or major liquidity .problems. This is a proper measure to compare companies from different countries mainly due to deprecations methods, once more it is considered that VW is undervalued. But according to the following ratio (P/FCF) the company may be overvalued since the ratio is way bigger than the average. Although it can also means that the average companies after paying debts, dividends and so on have negative FCF and the group doesn't.

EV/EBITDA reflects the price that investors have to pay for benefiting of company CF, yet again, the companies displays a value less than the average, for a solid company it means they are undervalued. The next ratio has exactly the same interpretation that's why it presents the same result, even considering depreciations, VW is undervalued.

According to the EV/Sales the company may be consider overvalued, but analysing the competitors sample, we see really low values, meaning that may be some of this companies don't perform as well as VW regarding sales.

Being the dividend yield the rate that investors receive, is priority that this value is at least the same as the industry average, which isn't the case with VW. But since this reflects what the group does with the remaining earnings, in some cases a small dividend yield can mean that the company inserts their earnings back into the business.

In appendix 11 it is possible to check all the relative valuation steps.

Conclusion

Along this MFW it is patent the relevance and supremacy of the Volkswagen Group in the studied industry. Furthermore all analysis points to a coherent, solid and consistent company that enjoys one of the very best reputations in the automotive industry.

If we go threw all the analysis made in this ER the results will meet what was said in the previous paragraph, for instance, in chapter 4.1. since 2006 until the end of 2013 their shares valued 148.09% almost two times more then their closest competitor BMW (regarding share price evolution) and more than 2.5 times than the DAX 30.

As for chapter 5, it's possible two observe one of two things, a tangible contribution for global economy and the improvement of their ratios leading the company to a stable financial position.

When concerning the preformed valuations, DCF and Relative, it stands out that the company is undervalued. Therefore the recommendation is to hold, since the Target price varies from 199.52 and 202.61, depending on the input, which represents a 1.33% and a 10.08% above the closing prices from 2013 and 2014 respectively. In the relative valuation most ratios indicate that the company is undervalued regarding the automotive industry, hence it becomes a rational strategy to hold or even acquire VW Group shares. Additionally it was discovered that this valuation is very sensitive to changes in Net Sales g, WACC and π & g.

In addition the strategy performed by the group has proved to be very successful. A strategy based in joint ventures, acquisition and empowering their values that are built around customer quality, developing services and improving technology.

Furthermore, a brief digital research on other final thesis about VW was performed. In ISCTE and Nova SBE I wasn't able to find any VW ER comprehended in the periods of 2011 until 2013. In Catolica Lisbon It wasn't possible to access the digital database.

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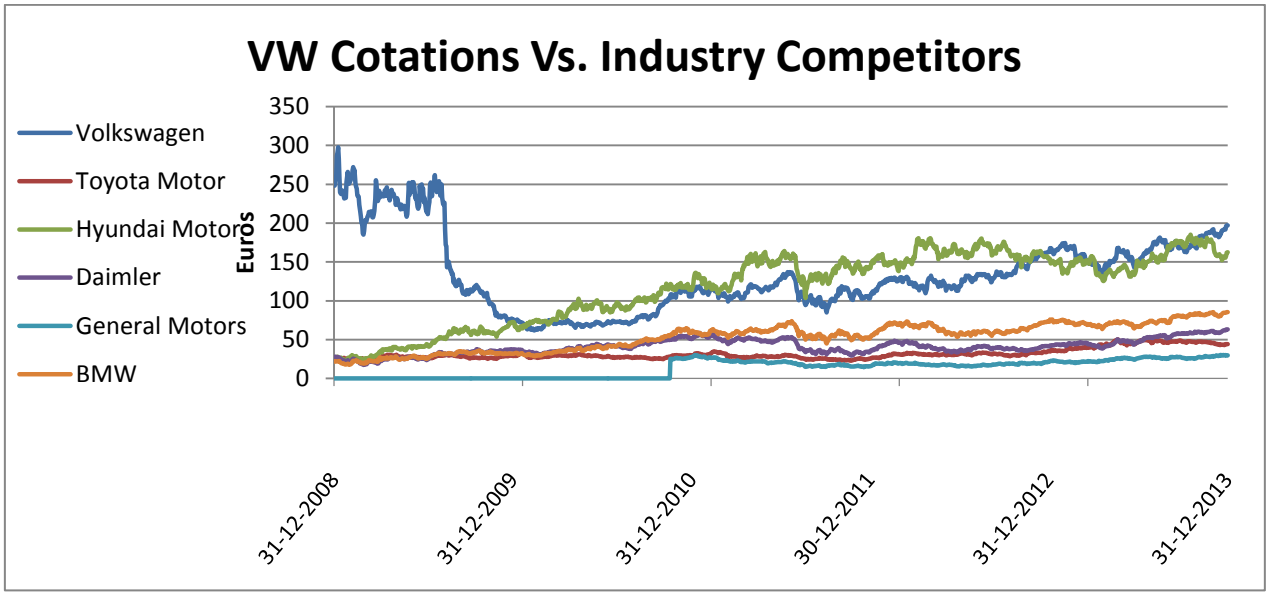
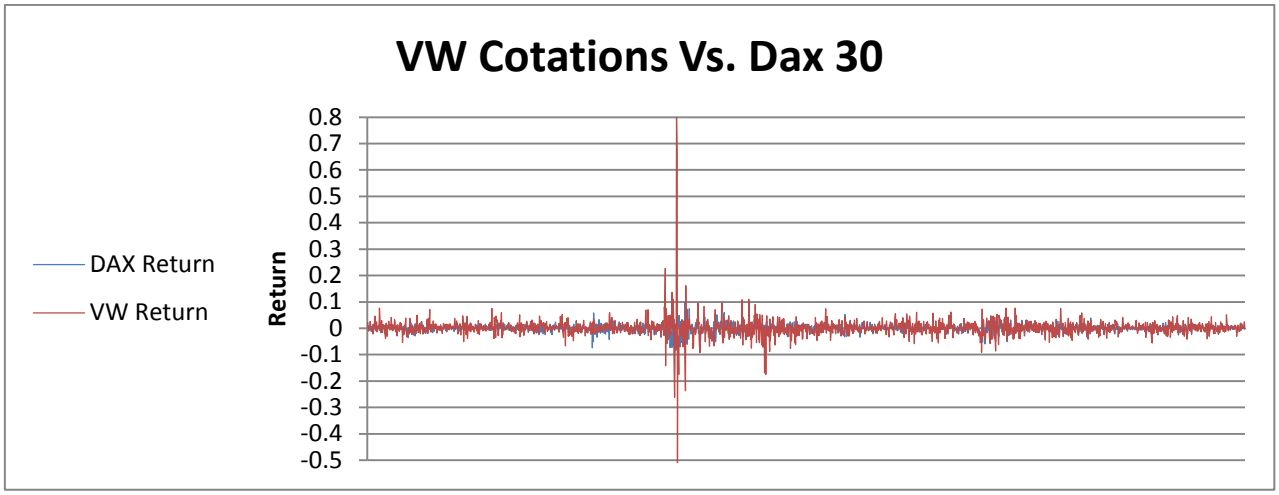
Appendix

Appendix 1 - Chart price performance comparison



Appendix 2 - Comparison with Dax 30

	Volkswagen Group	DAX 30
02/01/2006 - 29/12/2006	64.48%	19.10%
01/01/2007 - 31/12/2007	59.87%	20.12%
01/01/2008 - 31/12/2008	46.93%	-51.71%
01/01/2009 - 31/12/2009	-118.35%	21.39%
01/01/2010 - 31/12/2010	32.76%	14.89%
03/01/2011 - 30/12/2011	-8.29%	-16.98%
02/01/2012 - 31/12/2012	43.00%	22.55%
01/01/2013 - 31/12/2013	18.94%	22.70%
01/02/2006 -31/12/2013	**148.09%**	**56.12%**



Appendix 3 - Yearly variation of produced and sold units and employees

Δ Through the sample years	Δ 2008-2007 %	Δ 2009-2008 %	Δ 2010-2009 %	Δ 2011-2010 %	Δ 2012-2011 %	Δ 2013-2012 %	Δ 2013-2007 %
Number of sold vehicles	1.29%	0.61%	15.35%	14.88%	11.76%	4.11%	57.12%
Production	2.14%	-4.60%	21.51%	15.45%	8.96%	5.10%	56.56%
Employees	12.34%	-0.39%	8.38%	25.68%	9.52%	4.19%	73.94%

Source: VW

Appendix 4 - Financial Statements

IS in Million €	Pre-Crisis	Crisis					Post-Crisis
	2007	2008	2009	2010	2011	2012	2013
Net Sales	108,897	113,808	105,187	126,875	159,337	192,676	197,007
Cost of Sales	92,603	96,612	91,608	105,431	131,371	157,522	161,407
Gross profit	16,294	17,196	13,579	21,444	27,966	35,154	35,600
General Expenses	2,489	4,856	4,399	5,403	8,620	11,936	11,857
Other income	5,994	8,770	7,904	7,648	9,727	10,484	9,956
Other expenses	4,410	6,339	6,352	6,450	7,456	9,070	7,343
EBITDA	***15,389***	***14,771***	***10,732***	***17,239***	***21,617***	***24,632***	***26,356***
D&A	9,238	8,438	8,877	10,097	10,346	13,134	14,686
EBIT	***6,151***	***6,333***	***1,855***	***7,142***	***11,271***	***11,498***	***11,670***
Financial Gains	734	910	701	1,944	2,174	13,568	3,588
Financial Costs	1,647	1,815	2,268	2,144	2,047	2,546	2,366
Other Financial Results	1,305	1,180	972	2,053	7,528	2,967	465
EBT	***6,543***	***6,608***	***1,260***	***8,995***	***18,926***	***25,487***	***12,427***
Taxes	2,421	1,920	349	1,767	3,126	3,607	3,284
Net income	***4,122***	***4,688***	***911***	***7,228***	***15,800***	***21,880***	***9,143***

Source: VW

IS in Million €	Forecast				
	2014	2015	2016	2017	2018 - perpetuity
Net Sales	218,779.70	242,958.67	269,809.84	299,628.52	332,742.69
Cost of Sales	177,874.65	196,022.41	216,021.72	238,061.46	262,349.82
Gross profit	40,905.06	46,936.26	53,788.12	61,567.06	70,392.87
General Expenses	15,928.23	21,397.37	28,744.39	38,614.10	51,872.68
Other income	11,003.53	12,161.27	13,440.82	14,855.01	16,417.98
Other expenses	8,122.49	8,984.73	9,938.49	10,993.50	12,160.51
EBITDA	***27,858***	***28,715***	***28,546***	***26,814***	***22,778***
D&A	15,943.58	17,308.85	18,791.02	20,400.12	22,147.00
EBIT	***11,914***	***11,407***	***9,755***	***6,414***	***631***
Financial Gains	4,424.76	5,456.66	6,729.21	8,298.53	10,233.83
Financial Costs	2,533.49	2,712.84	2,904.89	3,110.53	3,330.72
Other Financial Results	624.48	838.65	1,126.27	1,512.54	2,031.28
EBT	***14,430***	***14,989***	***14,706***	***13,115***	***9,565***
T	3,158.06	3,036.95	2,920.49	2,808.49	2,700.79
Net income	***11,272***	***11,952***	***11,785***	***10,306***	***6,864***

Source: VW

BS in Million €	Pre-crisis	Crisis					Post-crisis
	2007	2008	2009	2010	2011	2012	2013
Assets							
Noncurrent Assets:							
Intangible assets	6,830	12,291	12,907	13,104	22,176	59,112	59,243
Property, plant and equipment	19,338	23,121	24,444	25,847	31,876	39,424	42,389
Leasing and rental assets	8,179	9,889	10,288	11,812	16,626	20,034	22,259
Investment property	152	150	216	252	340	433	427
Equity-accounted investments	7,795	6,373	10,385	13,528	10,249	7,309	7,934
Other equity Investments	548	583	543	640	3,049	3,870	3,941
Financial services receivables	27,522	31,855	33,174	35,817	42,450	49,785	51,198
Other financial assets	-	-	-	7,519	12,823	6,431	7,040
Other receivables	2,416	3,387	3,747	689	1,582	1,671	1,456
Tax receivables	952	763	685	4,248	627	552	633
Deferred tax assets	3,109	3,344	3,013	-	6,333	7,836	5,622
Total Noncurrent Assets:	76,841	91,756	99,402	113,456	148,131	196,457	202,142
Current Assets:							
Inventories	14,031	17,816	14,124	17,631	27,551	28,674	28,653
Trade receivables	5,691	5,969	5,692	6,883	10,479	10,099	11,133

Source: VW

BS in Million €	Pre-crisis	Crisis					Post-crisis
	2007	2008	2009	2010	2011	2012	2013
Financial services receivables	24,914	27,035	27,403	30,164	33,754	36,911	38,386
Other Financial assets	-	-	-	-	4,253	5,872	6,591
Other receivables	6,653	10,068	5,927	6,605	4,543	4,823	5,030
Tax receivables	500	1,024	762	482	623	761	729
Marketable securities	6,615	3,770	3,330	5,501	6,146	7,433	8,492
Cash, cash equivalents and time deposits	10,112	9,474	20,539	18,670	18,291	18,488	23,178
Assets held for sale	-	1,007	-	-	-	-	-
Total Current Assets:	68,516	76,163	77,777	85,936	105,640	113,061	122,192
Total Assets:	145,357	167,919	177,179	199,392	253,771	309,518	324,334
Equity & Liabilities							
Equity							
Subscribed capital	1,015	1,024	1,025	1,191	1,191	1,191	1,191
Capital Reserves	5,142	5,351	5,356	9,326	9,329	11,509	12,658
Retained earnings	25,718	28,636	28,901	35,461	47,019	64,596	72,341
Other reserves	-	-	-	-	-	386	- 459
Equity attributable to Volkswagen AG hybrid Capital Investors	-	-	-	-	-	-	2,004
Equity attributable to Volkswagen AG shareholders and hybrid capital investors	**31,875**	**35,011**	**35,282**	**45,978**	**57,539**	**77,682**	**87,735**
Non controlling interests	63	2,377	2,149	2,734	5,815	4,313	2,304
Total Equity:	31,938	37,388	37,431	48,712	63,354	81,995	90,039
Liabilities							
Noncurrent Liabilities:							
Financial liabilities	29,315	33,257	36,993	37,159	44,442	63,603	61,517
Other financial liabilities	-	-	-	-	2,547	2,397	2,305
Other liabilities	2,245	3,235	3,027	4,741	4,394	4,676	4,527
Deferred tax liabilities	2,637	3,654	2,224	1,669	4,055	9,050	7,894
Provisions for pensions	12,603	12,955	13,936	15,432	16,787	23,939	21,774
Provisions for taxes	2,275	3,555	3,946	3,610	3,721	4,239	3,674
Other provisions	8,276	9,073	10,088	11,170	13,235	14,094	13,981
Total Noncurrent Liabilities:	57,351	65,729	70,214	73,781	89,181	121,998	115,672
Current Liabilities:							
Put options and compensation rights granted to non controlling interest shareholders	-	-	-	-	-	-	3,635
Financial liabilities	28,677	36,123	40,606	39,852	49,090	54,060	59,987

Source: VW

BS in Million €	Years						
	Pre-crisis	Crisis					Post-crisis
	2007	2008	2009	2010	2011	2012	2013
Trade payables	9,099	9,676	10,225	12,544	16,325	17,268	18,024
Tax payables	98	59	73	286	844	238	218
Other financial liabilities	-	-	-	-	4,888	4,425	4,526
Other Liabilities	7,084	8,545	8,237	10,627	11,196	11,111	11,004
Provisions for taxes	1,828	1,160	973	2,077	2,888	1,721	2,869
Other provisions	9,282	8,473	9,420	11,513	16,005	16,702	18,360
Liabilities associated with assets held for sale	-	766	-	-	-	-	-
Total Current Liabilities:	56,068	64,802	69,534	76,899	101,236	105,525	118,623
Total Liabilities:	113,419	130,531	139,748	150,680	190,417	227,523	234,295
Total Equity & Liabilities:	145,357	167,919	177,179	199,392	253,771	309,518	324,334

Source: VW

BS in Million €	Forecast				
	2014	2015	2016	2017	2018 - perpetuity
Assets					
Noncurrent Assets:					
Intangible assets	66,384.34	74,387	83,353	93,401	104,660
Property, plant and equipment	47,499	53,224	59,640	66,829	74,885
Leasing and rental assets	24,942	27,949	31,318	35,093	39,323
Investment property	478	536	601	673	754
Equity-accounted investments	8,890	9,962	11,163	12,509	14,016
Other equity Investments	4,416	4,948	5,545	6,213	6,962
Financial services receivables	57,370	64,285	72,034	80,717	90,447
Other financial assets	7,889	8,840	9,905	11,099	12,437
Other receivables	1,632	1,828	2,049	2,295	2,572
Tax receivables	709	795	891	998	1,118
Deferred tax assets	6,300	7,059	7,910	8,863	9,932
Total Noncurrent Assets:	226,509	253,813	284,408	318,692	357,108
Current Assets:					
Inventories	32,107	35,977	40,314	45,174	50,619
Trade receivables	12,475	13,979	15,664	17,552	19,668
Financial services receivables	43,013	48,198	54,008	60,518	67,813
Other Financial assets	7,385	8,276	9,273	10,391	11,644
Other receivables	5,636	6,316	7,077	7,930	8,886
Tax receivables	817	915	1,026	1,149	1,288
Marketable securities	9,516	10,663	11,948	13,388	15,002

Source: VW

BS in Million €	Forecast				
	2014	2015	2016	2017	2018 - perpetuity
Cash, cash equivalents and time deposits	25,972	29,103	32,611	36,542	40,947
Total Current Assets:	136,921	153,426	171,921	192,645	215,867
Total Assets:	363,430	407,239	456,329	511,336	572,975
Equity & Liabilities					
Equity					
Subscribed capital	1,335	1,495	1,676	1,878	2,104
Capital Reserves	14,184	15,894	17,809	19,956	22,362
Retained earnings	81,061	90,833	101,782	114,051	127,799
Other reserves	-514	-576	-646	-724	-811
Equity attributable to Volkswagen AG hybrid Capital Investors	2,246	2,516	2,820	3,159	3,540
Equity attributable to Volkswagen AG shareholders and hybrid capital investors	98,311	110,162	123,441	138,321	154,994
Non controlling interests	2,582	2,893	3,242	3,632	4,070
Total Equity:	100,893	113,054	126,682	141,953	159,065
Liabilities					
Noncurrent Liabilities:					
Financial liabilities	68,932	77,242	86,553	96,986	108,677
Other financial liabilities	2,583	2,894	3,243	3,634	4,072
Other liabilities	5,073	5,684	6,369	7,137	7,997
Deferred tax liabilities	8,846	9,912	11,107	12,445	13,946
Provisions for pensions	24,399	27,340	30,635	34,328	38,466
Provisions for taxes	4,117	4,613	5,169	5,792	6,491
Other provisions	15,666	17,555	19,671	22,042	24,699
Total Noncurrent Liabilities:	129,615	145,240	162,747	182,365	204,348
Current Liabilities:					
Put options and compensation rights granted to non controlling interest shareholders	4,073	4,564	5,114	5,731	6,422
Financial liabilities	67,218	75,321	84,400	94,574	105,974
Trade payables	20,197	22,631	25,359	28,416	31,842
Tax payables	244	274	307	344	385
Other financial liabilities	5,072	5,683	6,368	7,136	7,996
Other Liabilities	12,330	13,817	15,482	17,349	19,440
Provisions for taxes	3,215	3,602	4,037	4,523	5,068
Other provisions	20,573	23,053	25,832	28,946	32,435
Total Current Liabilities:	132,922	148,945	166,899	187,018	209,562
Total Liabilities:	262,538	294,185	329,647	369,383	413,910
Total Equity & Liabilities:	363,430	407,239	456,329	511,336	572,975

Source: VW

Appendix 5 - Weight and dollar amount of sold products

Sales & Revenue by types	2007	2008	2009	2010	2011	2012	2013
Vehicles	**86,159**	**87,850**	78,590	**94,818**	116,449	134,537	134,842
Genuine parts	6,512	7,254	7,768	8,902	9,784	12,070	13,564
Used vehicles and third-party products	-	-	-	1,940	6,023	7,735	8,973
Engines, powertrains and parts deliveries	-	-	-	4,152	5,438	8,990	8,441
Power Engineering	-	-	-	-	662	4,222	3,845
Motorcycles	-	-	-	-	-	148	452
Rental and leasing business	5,311	5,819	6,631	3,993	10,245	11,825	13,948
Interest and similar income	3,201	4,357	4,884	7,893	5,535	6,337	6,034
Other sales revenue	7,714	8,528	7,312	5,178	5,200	6,812	6,909
Total	108,897	113,808	105,185	126,876	159,336	192,676	197,008

Source: VW

Weight Sales & Revenue by types	2007	2008	2009	2010	2011	2012	2013
Vehicles	79.12%	77.19%	74.72%	74.73%	73.08%	69.83%	68.44%
Genuine parts	5.98%	6.37%	7.39%	7.02%	6.14%	6.26%	6.88%
Used vehicles and third-party products	0.00%	0.00%	0.00%	1.53%	3.78%	4.01%	4.55%
Engines, powertrains and parts deliveries	0.00%	0.00%	0.00%	3.27%	3.41%	4.67%	4.28%
Power Engineering	0.00%	0.00%	0.00%	0.00%	0.42%	2.19%	1.95%
Motorcycles	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	0.23%
Rental and leasing business	4.88%	5.11%	6.30%	3.15%	6.43%	6.14%	7.08%
Interest and similar income	2.94%	3.83%	4.64%	6.22%	3.47%	3.29%	3.06%
Other sales revenue	7.08%	7.49%	6.95%	4.08%	3.26%	3.54%	3.51%
Total	100%	100%	100%	100%	100%	100 %	100%

Appendix 6 - EBITDA by Segment

EBITDA in Million € by segment	2007	2008	2009	2010	2011	2012	2013
Net Sales	**108,897**	**103,808**	**105,187**	**126,875**	**159,336**	**192,676**	**197,007**
Automotive Division	98,752	102,632	93,041	112,806	142,092	172,822	175,003
Financial Division	10,145	1,176	12,146	14,069	17,244	19,854	22,004
Cost of Sales	**92,603**	**96,612**	**91,608**	**105,431**	**131,371**	**157,523**	**161,407**
Automotive Division	84,674	87,895	82,068	94,746	117,853	142,159	144,481
Financial Division	7,929	8,717	9,540	10,685	13,518	15,364	16,926
Gross profit	**16,294**	**7,196**	**13,579**	**21,444**	**27,965**	**35,153**	**35,600**
Automotive Division	14,078	14,737	10,973	18,060	24,239	30,663	30,522

EBITDA in Million € by segment	2007	2008	2009	2010	2011	2012	2013
Financial Division	2,216	- 7,541	2,606	3,384	3,726	4,490	5,078
General Expenses	**2,489**	**4,856**	**4,399**	**5,402**	**8,620**	**11,956**	**11,856**
Automotive Division	3,322	5,635	5,521	6,350	9,527	13,114	13,500
Financial Division	- 833	- 779	- 1,122	- 948	- 907	- 1,158	- 1,644
Other net income	**1,584**	**2,431**	**1,553**	**1,197**	**2,272**	**3,257**	**2,613**
Automotive Division	1,867	3,006	2,553	2,231	3,104	2,336	3,571
Financial Division	- 283	- 575	- 1,000	- 1,034	- 832	921	- 958
EBITDA	***15,389***	***4,771***	***10,733***	***17,239***	***21,617***	***26,454***	***26,357***
Automotive Division	12,623	12,108	8,005	13,941	17,816	19,885	20,593
Financial Division	2,766	- 7,337	2,728	3,298	3,801	6,569	5,764
D&A	9,238	8,438	8,877	10,097	10,346	13,134	14,686
Automotive Division	7,429	6,680	6,740	7,751	7,843	9,982	10,786
Financial Division	1,809	1,758	2,137	2,346	2,503	3,152	3,900

Source: VW

Appendix 7 - IS yearly variation

IS yearly variation	Δ 2008-2007 %	Δ 2009-2008 %	Δ 2010-2009 %	Δ 2011-2010 %	Δ 2012-2011 %	Δ 2013-2012 %	Δ 2013-2007 %
Net Sales	4.51%	-7.58%	20.62%	25.59%	20.92%	2.25%	80.91%
Cost of Sales	4.33%	-5.18%	15.09%	24.60%	19.91%	2.47%	74.30%
Gross profit	5.54%	-21.03%	57.92%	30.41%	25.70%	1.27%	118.49%
%							
General Expenses	95.10%	-9.41%	22.82%	59.54%	38.47%	-0.66%	376.38%
Other income	46.31%	-9.87%	-3.24%	27.18%	7.78%	-5.04%	66.10%
Other expenses	43.74%	0.21%	1.54%	15.60%	21.65%	-19.04%	66.51%
EBITDA	-4.02%	-27.34%	60.63%	25.40%	13.95%	7.00%	71.27%
D&A	-8.66%	5.20%	13.74%	2.47%	26.95%	11.82%	58.97%
EBIT	2.96%	-70.71%	285.01%	57.81%	2.01%	1.50%	89.73%
Financial Gains	23.98%	-22.97%	177.32%	11.83%	524.10%	-73.56%	388.83%
Financial Costs	10.20%	24.96%	-5.47%	-4.52%	24.38%	-7.07%	43.66%
Other Financial Results	-9.58%	-17.63%	111.21%	266.68%	-60.59%	-84.33%	-64.37%
EBT	0.99%	-80.93%	613.89%	110.41%	34.67%	-51.24%	89.93%
T	-20.69%	-81.82%	406.30%	76.91%	15.39%	-8.95%	35.65%
Net income	13.73%	-80.57%	693.41%	118.59%	38.48%	-58.21%	121.81%

Appendix 8 - Operational indicators summary

Operational indicators summary	2007	2008	2009	2010	2011	2012	2013
EBITDA	15,389	14,771	10,732	17,239	21,617	24,632	26,356
EBIT	6,151	6,333	1,855	7,142	11,271	11,498	11,670
EBITDA Margin	13.39%	12.05%	9.49%	12.81%	12.79%	12.12%	12.73%
EBIT Margin	5.35%	5.17%	1.64%	5.31%	6.67%	5.66%	5.64%
EBT	6,543	6,608	1,260	8,995	18,926	25,487	12,427
Net Income	4,122	4,688	911	7,228	15,800	21,880	9,143
Capex	-	5,450	43	11,281	14,642	18,641	8,044
EBITDA - Capex	-	9,321	10,689	5,958	6,975	5,991	18,312
Net debt	27,019	35,423	30,979	31,864	39,659	48,842	59,113
Working Capital	12,448	11,361	8,243	9,037	4,404	7,536	3,569
Working Capital Needs	-	15,992	1,920	12,712	41,107	12,427	12,292
Liquidity	-	- 4,631	6,323	- 3,675	- 36,703	- 4,891	- 8,723
Liquidity Ratio	0	0.71	4.29	0.71	0.11	0.61	0.29
ROE	12.91%	12.54%	2.43%	14.84%	24.94%	26.68%	10.15%
ROA	2.84%	2.79%	0.51%	3.63%	6.23%	7.07%	2.82%
RS	3.79%	4.12%	0.87%	5.70%	9.92%	11.36%	4.64%

Source: VW

Appendix 9 - DCF Valuation

	2008	2009	2010	2011	2012	2013
EBIT (1-tc)	4,465	1,308	5,035	7,946	8,106	8,227
D&A	8,438	8,877	10,097	10,346	13,134	14,686
Δ Provisions	- 16	452	5,587	5,872	- 555	2,699
Δ NWC	15,992	1,920	12,712	41,107	12,427	12,292
Δ Investment in Fixed Assets	9,245	1,940	1,601	15,102	44,485	3,097
FCF	***- 12,318***	***5,873***	***- 4,768***	***- 43,789***	***- 35,117***	***4,825***

	2014	2015	2016	2017	2018
EBIT (1-tc)	11,914	11,407	9,755	6,414	631
D&A	15,944	17,309	18,791	20,400	22,147
Δ Provisions	3,885	4,354	4,879	5,467	6,126
Δ NWC	23,422	26,246	29,410	32,955	36,927
Δ Investment in Fixed Assets	12,252	13,729	15,384	17,238	19,316
FCF	***- 11,702***	***- 15,613***	***- 21,126***	***- 28,845***	***- 39,591***

	Normalized 2008	Normalized 2009	Normalized 2010	Normalized 2011	Normalized 2012	Normalized 2013
EBIT (1-tc)	4,465	1,308	5,035	7,946	8,106	8,227
D&A	8,438	8,877	10,097	10,346	13,134	14,686
Δ Provisions	0	0	0	0	0	0
Δ NWC	0	0	0	0	0	0
Δ Investment in Fixed Assets	9,245	1,940	1,601	15,102	44,485	3,097
FCF	***3,658***	***8,245***	***13,531***	***3,190***	***-23,245***	***19,816***

	Normalized 2014	Normalized 2015	Normalized 2016	Normalized 2017	Normalized 2018
EBIT (1-tc)	11,914	11,407	9,755	6,414	631
D&A	15,944	17,309	18,791	20,400	22,147
Δ Provisions	0	0	0	0	0
Δ NWC	0	0	0	0	0
Δ Investment in Fixed Assets	12,252	13,729	15,384	17,238	19,316
FCF	***15,606***	***14,987***	***13,162***	***9,577***	***3,462***

	2008	2009	2010	2011	2012	2013
t	1	2	3	4	5	1
FCF	3,658	8,245	13,531	3,190	-23,245	19,816
(1+WACC)^t	1.06	1.12	1.20	1.28	1.36	1.06
FCF/(1+WACC)^t	3,466	7,366	11,289	2,498	-17,053	18,656

	2014	2015	2016	2017	2018 - perpetuity
t	2	3	4	5	6
FCF	15,606	14,987	13,162	9,577	3,462
(1+WACC)^t	1.13	1.20	1.27	1.35	1.35
FCF/(1+WACC)^t	13,832	12,506	10,340	7,083	74,695.03

Appendix 10 - Sensitivity Analysis

EBITDA		*10,000*	*12,000*	*14,000*	*16,000*	*18,000*	*20,000*
Target Price	199.52	176.49	179.30	182.12	184.93	187.75	190.57

EBITDA		*22,000*	*24,000*	*26,000*	*28,000*	*30,000*	*32,000*	*34,000*
Target Price	199.52	193.38	196.20	199.02	201.83	204.65	207.47	210.28

199.52		Cost of Equity										
		7.64%	*7.95%*	*8.26%*	*8.57%*	*8.88%*	*9.19%*	*9.50%*	*9.81%*	*10.12%*	*10.43%*	*10.74%*
Cost of Debt	*0.20%*	350.98	321.43	296.52	275.23	256.80	240.70	226.49	213.85	202.53	192.33	183.08
	0.40%	341.60	313.56	289.82	269.45	251.77	236.27	222.56	210.34	199.37	189.47	180.48
	0.60%	332.70	306.07	283.42	263.92	246.93	232.00	218.77	206.94	196.31	186.70	177.95
	0.80%	324.27	298.93	277.30	258.61	242.28	227.89	215.10	203.65	193.34	184.00	175.49
	1.00%	316.26	292.12	271.44	253.50	237.80	223.92	211.55	200.46	190.46	181.38	173.10
	1.20%	308.64	285.62	265.82	248.60	233.48	220.08	208.12	197.37	187.66	178.83	170.76
	1.40%	301.38	279.40	260.43	243.88	229.31	216.37	204.79	194.37	184.93	176.34	168.49
	1.60%	294.46	273.45	255.26	239.34	225.29	212.78	201.57	191.46	182.29	173.93	166.27
	1.80%	287.85	267.75	250.29	234.96	221.40	209.30	198.44	188.62	179.71	171.57	164.11
	2.00%	281.54	262.29	245.51	230.74	217.65	205.94	195.41	185.87	177.20	169.27	161.99
	2.20%	275.50	257.04	240.91	226.67	214.02	202.68	192.46	183.20	174.76	167.04	159.93
	2.40%	269.71	252.00	236.47	222.74	210.50	199.52	189.60	180.60	172.38	164.85	157.92
	2.60%	264.17	247.16	232.20	218.94	207.10	196.45	186.82	178.07	170.07	162.72	155.96
	2.80%	258.85	242.49	228.08	215.27	203.80	193.48	184.12	175.61	167.81	160.65	154.04
	3.00%	253.74	238.00	224.10	211.71	200.61	190.59	181.50	173.21	165.61	158.62	152.16
	3.20%	248.82	233.67	220.25	208.27	197.51	187.78	178.94	170.87	163.46	156.64	150.33
	3.40%	244.10	229.50	216.54	204.94	194.51	185.06	176.46	168.59	161.37	154.70	148.53
	3.60%	239.55	225.47	212.94	201.71	191.59	182.41	174.04	166.37	159.32	152.81	146.78
	3.80%	235.16	221.58	209.46	198.58	188.75	179.83	171.68	164.20	157.32	150.96	145.06
	4.00%	230.94	217.82	206.09	195.54	186.00	177.32	169.38	162.09	155.37	149.16	143.38
	4.20%	226.86	214.18	202.83	192.60	183.32	174.87	167.14	160.03	153.47	147.39	141.74
	4.40%	222.92	210.66	199.66	189.73	180.72	172.49	164.95	158.01	151.60	145.66	140.13
	4.60%	219.11	207.26	196.59	186.95	178.18	170.17	162.82	156.05	149.78	143.97	138.55
	4.80%	215.44	203.96	193.62	184.25	175.72	167.91	160.74	154.13	148.00	142.31	137.00
	5.00%	211.88	200.76	190.72	181.62	173.32	165.71	158.71	152.25	146.26	140.69	135.49

β=		*1.26*	*1.27*	*1.28*	*1.29*	*1.3*	*1.31*	*1.32*	*1.33*	*1.34*	*1.35*	*1.36*	*1.37*
Target Price	199.52	211.25	209.20	207.19	205.22	203.29	201.38	199.52	197.69	195.89	194.12	192.38	190.67

BS g	Target Price
	199.52
11.73%	236.53
11.78%	230.41
11.84%	224.27
11.89%	218.11
11.95%	211.93
12.00%	205.73
12.05%	199.52
12.10%	194.28
12.15%	189.02
12.19%	183.75
12.24%	178.47
12.28%	173.17
12.33%	167.86
12.37%	162.54
12.42%	157.20

g	Target Price
	199.52
0.00%	156.12
0.25%	162.86
0.50%	170.39
0.75%	178.88
1.00%	188.51
1.25%	199.52
1.50%	212.24
1.75%	227.11
2.00%	244.70
2.25%	265.86
2.50%	291.78

π	Target Price
	199.52
0.74%	172.38
0.97%	180.37
1.20%	189.35
1.43%	199.52
1.66%	211.13
1.89%	224.51
2.12%	240.10
2.35%	258.50
2.58%	280.53

Appendix 11 - Relative valuation steps

Company	Enterprise Value	EBIT	EBITDA	Sales	Closing Price 12/31/13
Toyota Group	222,726.50	12,434.42	22,837.57	207,705.37	44.33
Hyundai Motor Company	25,574.90	2,560.48	3,675.06	28,688.27	162.62
Daimler	137,534.40	7,856.00	12,224.00	117,982.00	63.07
BMW	133,195.00	7,937.00	14,892.00	76,058.00	85.50
GM	34,715.10	5,672.00	13,713.00	155,427.00	29.66
Volkswagen AG	154,282.35	11,670.00	26,356.00	197,007.00	196.90

Company	EPS	CF Per share	FCF Per share	Book value per share	Dividend Yield
Toyota Group	2.86	7.29	4.75	31.75	0.02
Hyundai Motor Company	13.12	21.03	15.06	137.00	0.82%
Daimler	6.4	3.0735	-1.5812	39.8953	3.58%
BMW	8.1	5.3233	-4.8431	54.0263	3.05%
GM	2.38	9.07	3.64	24.8448	-
Volkswagen AG	18.7	39.667	16.2457	188.58	2.00%

Company	PER	PBV	P/S	P/CF	P/FCF	EV / EBITDA	EV / EBIT	EV / Sales	Dividend Yield
Toyota Group	15.50	1.40	0.0002	6.08	9.34	9.75	17.91	1.07	1.85%
Hyundai Motor Company	12.40	1.19	0.006	7.73	10.80	6.96	9.99	0.89	0.82%
Daimler	9.85	1.58	0.0005	20.52	-39.89	11.25	17.51	1.17	3.58%
BMW	10.56	1.58	0.001	16.06	-17.65	8.94	16.78	1.75	3.05%
GM	12.46	1.19	0.0002	3.27	8.16	2.53	6.12	0.22	-
Average	12.15	1.39	0.002	10.73	-5.85	7.89	13.66	1.02	2.33%
Median	12.40	1.40	0.001	7.73	8.16	8.94	16.78	1.07	2.45%
Standard Deviation	2.19	0.20	0.002	7.25	22.37	3.37	5.31	0.55	1.24%
Volkswagen AG	10.53	1.04	0.001	4.96	12.12	5.85	13.22	5.85	2.00%